A Database Publication

THE MICRO USER

Volume 8 Number 12 February 1991 £1.50

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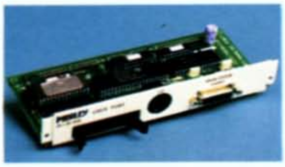

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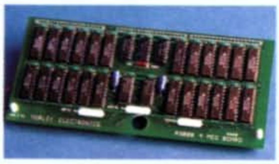

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SPECIALS • SPECIALS •

27 **Graph Maker** Produced professional quality graphics on your BBC Micro. *

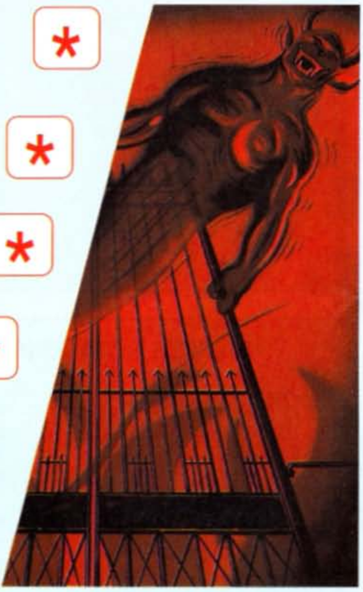
37 **Shopping List** Make all your trips to the shops easier with this superb utility. *

41 **Function Keys** Use this simple program to print up your own function key strips. *

56 **Checksums** We repeat the routines that make typing in programs much easier. *

73 **Games Diary** More on of how a top programmer creates a commercial game

91 **Got it wrong** A brand new series on how to get the bugs out of programs. *



Type-it-in

This symbol indicates that the feature contains at least one full length listing for you to key in on your micro. *

All the major listings in this magazine are accompanied by checksums to help you key them in correctly. For full details of how to use them see the article on page 56 of this issue. *Get it right* ✓

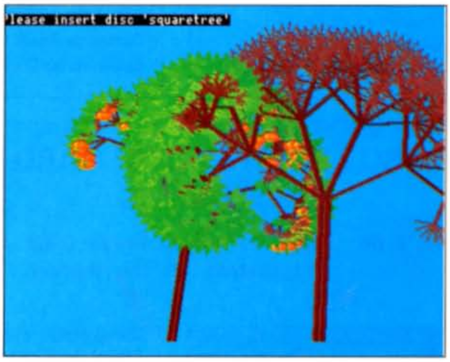
MICRO USER CLASSIFIEDS

The best bargains in the world of all Acorn micros come from fellow readers of The Micro User. Turn to Page 103 to find just what you're looking for – from cheap modems to complete computer systems.

Education

63 **Update** Up-to-the-minute news of the Acorn range of micros in use in the world of education.

64 **Reviews** Catch up on the latest software for the BBC Micro series in schools, including:
- Buy 'em down
- Mark Master
- Dust
- Art Machine



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lease insert disc 'squaretree'
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Art by Art Machine

REGULARS: News 7 • Hac Man 34 • PD Page 48 • Mad Hatter 54 •

ALS • SPECIALS

93 **Bombed**
Play this sequal to The Gate and recover the crosses from Hell. *

100 **ClockCalc**
With memory space at a premium use this short DeskTop accessory on your Arc. *

105 **Shorts**
Learn how code numbers are used to check if an ISBN is correct. *

111 * **Dragon Curve**
Fractals can be confusing but this simple curve can make it all much clearer.

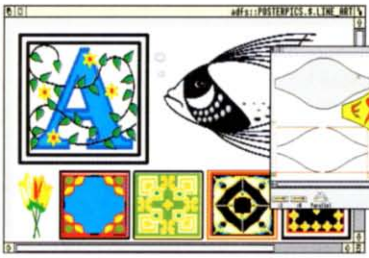
Newcomers

31 **Premier 3**
We look at the latest version of Premier and see what it's potential really is.

61 **!Impression Junior**
Can you get in on the ground floor of DTP with this simpler version of Impression?

47 **Corplan**
Is there still a market for Wordwise Plus add-ons? This new package is food for thought.

97 **!Poster**
Is this the most flexible drawing package ever devised? Check out how it performs.


adfs::POSTERPICS.$.LINE_ART
EYE SPY

115 **!ArcLight**
The ray-tracing addition to the Euclid family is given a thorough testing and once-over.

FREE Software

Subscribers to *The Micro User* will receive the following software on disc or tape wth this month's magazine:

- Shopping List
- Graph maker
- Bombed

In addition, those readers with a BBC A3000 or Archimedes series machine will also get:

- !ClockCalc
- !SparkPlug
- Plus 1.2Mb of PD software

THE MICRO USER
THE MICRO USER

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Key to which micro articles are suitable for

e	Electron
B	BBC B
+	BBC B+
M	Master 128
Compact	Master Compact
◢	Archimedes series and BBC A3000

NEXT MONTH IN

THE MICRO USER

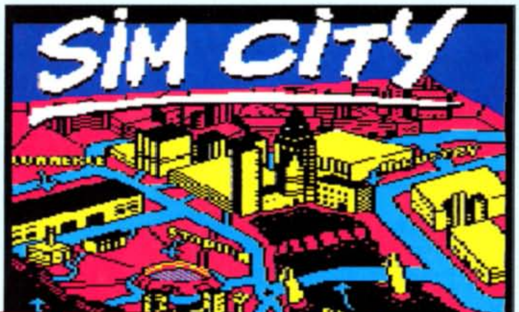
We celebrate the start of our ninth sparkling year of dedication to the BBC Micro with another dazzling array of utilities and programs. Not forgetting all our regular features plus our money-saving PD section.

16 **Our reviewers delve deep into the depths of the latest games releases**

SOFTWARE SCENE

SCORE
WAVE
LIVES
SHIELDS
0002832
003
01
006

Alien Invasion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SQUARE ROUTE
NAME
SCORE
LEVEL
STEVE
COMPUTEREYES
PRESS P (OR ADJUST) TO EN

Square Route

The Wimp Game

Body Building 107 • Routine Matters 120 • Problem Solved 125 • Letters 127

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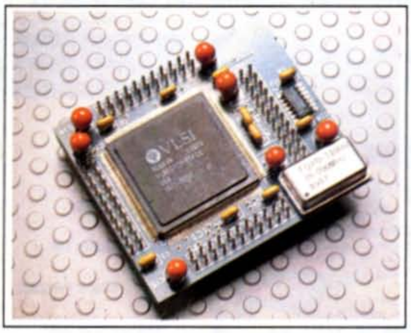
Carriage is £8.00 per drive. Add 10 to stock code for drives without terminators (e.g 5220 becomes 5230). Drives are available without interface - deduct £99.



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The ARM3 micro-processor is the latest in the series of Acorn RISC Machine reduced instruction set processors. It is the micro-processor fitted as standard to Acorn's new flagship - the 540.

This new card from Beebug allows a super-fast ARM3 processor running at 32 MHz to be fitted to your Archimedes 300 or 400 series computer. The highly compact circuit board measures just 55 by 60 mm (approx) and contains the latest surface mounted ARM3 processor together with a clock generator circuit.

The ARM3 Card is inserted in place of the existing ARM2 processor and provides a four-fold increase in processor clock speed along with a 4Kbyte cache which serves to isolate the fast processor from the relatively slow RAM. Average speed increases of 3 to 5 times are typical, and unlike speed enhancers such as floating point co-processors, the ARM3 Card improves performance of all software. Users of the PC Emulator will especially benefit from the increased execution speed.

The ARM3 Card is supplied with disc-based software to control the cache operation, both from the Desktop and via star commands. The comprehensive user guide not only covers the control of the ARM3 card at all levels, but also contains details of differences between the ARM2 and ARM3, and a section explaining the theory of cache systems.

Note: The Beebug ARM3 Card must be fitted by an Acorn approved component level service centre, as the existing ARM 2 chip has to be removed. This includes Beebug and many major Acorn dealers. The Beebug ARM3 is unsuitable for the A3000, as the ARM2 processor in this machine is soldered directly to the circuit board.

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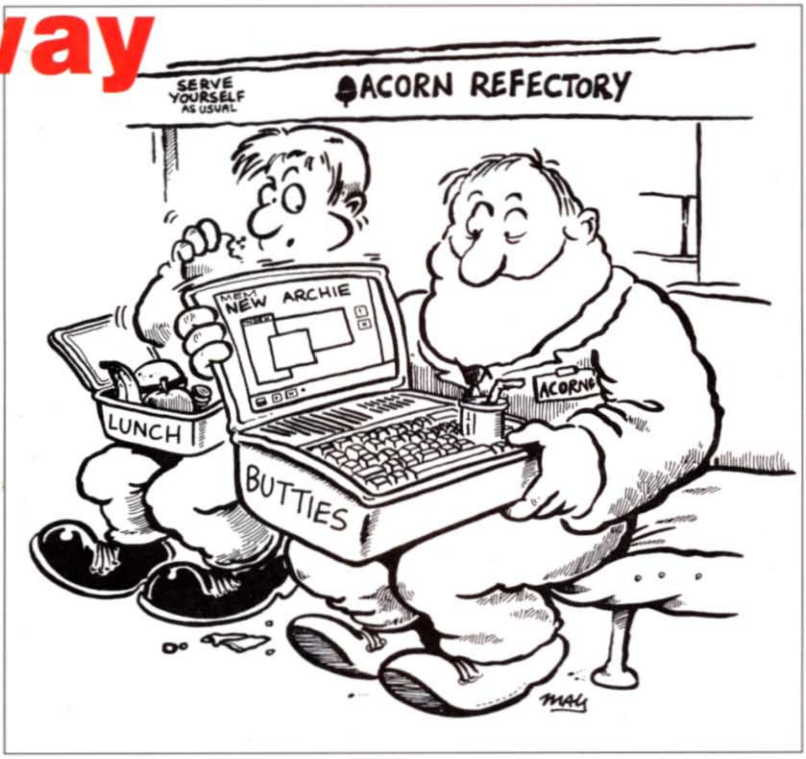
News BEAT

First Arc laptops on the way



THE Micro User can exclusively reveal that two new laptops based on RISC chip technology will be launched this year.

One will come from Acorn itself – and is likely to appear in late spring – while the other is being developed by Mike Harrison, a leading independent backroom boy whose name is regularly linked with Watford Electronics.

The price tag for both the new portables is likely to be in the region of £1,000.

Although neither party is prepared to comment on the top secret projects at this stage, *The Micro User* has confirmation from an unimpeachable source that the race is on to unveil the first RISC based laptop.

While details of the Acorn machine are still under wraps for the moment, a prototype of the Harrison box was actually shown to a handful of high powered visitors at the recent Watford Electronics Open Day.

Codenamed the "Butty Box", it is based on the A3000 board and will come complete with an LCD monochrome screen. It runs in a special screen mode designed for LCD display.

The laptop has a modified screen pointer – making it easier to see – and it is likely to work with a trackball device instead of a mouse.

It is believed that Mike Harrison is currently struggling to overcome power source problems for the battery-run machine before going into production.

Meanwhile Acorn still refuses to be drawn on the subject. "I'm afraid we have no comment to make", says Simon Lovesey, the company's UK marketing manager.

However *The Micro User*'s source insists he has first hand knowledge of both machines, and added: "Although everyone is obviously still playing it tightlipped at the moment, there certainly are two RISC chip based laptops on the way.

"There have been a lot of guesses about an Archimedes style portable for quite some time. But now I can confirm that there will in fact be two and not one".

Emulation explained

A NEW book available from Watford Electronics (0923 50335) aims to clear up the confusion of Archimedes and BBC A3000 owners who want to use them in PC emulation mode but are unsure of the new commands.

Acorn to PC was written by Dr. John Lockley, a regular contributor on Radio 5 and is co-author of The Complete BBC Computer User Handbook.

Although Acorn machines are mainly used in education, most PCs and commercial machines use the MSdos operating system which can confuse education users.

There is even one Acorn command which, if used in MSdos, wipes everything in the current directory.

Acorn to PC can be used in the same way as a foreign language dictionary to transfer from Acorn to MSdos or back. It also acts as a handy reference guide to all Acorn star commands and their MSdos equivalents, with explanations of the directory tree and heirarchical filing systems in general.

Acorn to PC costs £15.95.

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  - 'Assembler Workshop' — all about ARM Assembler
  - 'Beginning 'C' — series on C language
  - 'DTP/WP' — tips on using commercially available packages
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  - '512 Forum' for users of the Master 512
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  - 'BEEBUG Education'
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  - Upgrading to an Archimedes, Writing a Compiler
  - Using the ROM Filing System, Bas128
  - Music Programming in Ample
- Hints and tips
- Postbag for your letters and answers to your questions and lots more

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Expanding the A3000

ARCHIMEDES expansion cards can now be used with the A3000. New from Wild Vision (091-519 1455) is an A3000 expansion box which fits neatly into the rear of the computer and holds two width or three half width cards.

Housed in a robust steel case, it includes a backplane with multilayer construction to ensure minimum signal timing changes, an important asset for high performance cards such as the Wild Vision Hawk V9 colour digitiser which uses the MEMC interface at maximum speed.

The expansion box comes with an external 12v power supply and a power protection relay in the unit prevents damage to the computer from external supplies.

The box, which is easily installed into the rear expansion port of the A3000, costs £159.85, but as a special introductory offer Wild Vision are bundling it with Hawk V9 colour digitiser for £458.85 – a saving of £79 on the usual list price.

New bridge between 6502 and Risc OS

ACORN has developed an enhanced version of its BBC Model B Emulator – the 65Host – for the BBC A3000 and Archimedes range.

The breakthrough creates a more sophisticated software bridge between the BBC Model B, B+, Master 128, Compact and Electron, and the Risc OS environment.

As a result it will be much easier to convert existing 6502 software to run on the more powerful Risc-based machines.

The new emulator will also enable independent software vendors to develop Risc OS versions of their established 6502-based packages.

However, the enhanced emulator is aimed primarily at schools which already possess extensive libraries of software for the BBC Micro and have either acquired – or are thinking about purchasing – a BBC A3000 or an Archimedes.

The software comprises an improved version of 65Host which emulates the BBC Model B environment.

It also includes utilities to help transfer and modify 6502-based programs for use with Risc OS computers and examples which illustrate how to port existing programs.

A user guide supplied with the product covers all aspects of emulation and continuity including legal issues.

The emulator is to be made available to schools and colleges through local education authorities and to independent software vendors through Acorn itself.

Users of SID (Acorn's Support Information Database) can download the software – including an electronic version of the manual – completely free of charge.

This disc was also be made generally available – until March 31 – at a discounted price of £19.95.

Readers wishing to take advantage of this offer should send their cheques to Acorn Direct, 13 Dennington Road, Wellingborough, Northants NN8 3RL.

College packs

DEVELOPED and tested in West Midlands College, three new packages have been launched by Panda Discs.

Touch and Learn is a content free Concept Keyboard program for use by teachers in primary and secondary education. It turns BBC Micros into question and answer machines. The package asks the questions and the answers are given by touching overlays on the Concept Keyboard.

Touch and Learn can also be used for storing information in the form of records. In question mode a score is given at the end of each run.

In database mode multiple records can be stored under any overlay item and in both modes questions and records can be passed to a word-processor for subsequent printing.

+Windows is for use with Wordwise Plus and allows green embedded commands to be obtained through a series of pull-down menus.

Although it was originally developed as an aid for students with special needs, early indications are that it will have a much wider appeal for many users of Wordwise Plus.

Draft Print and Final Print options take over all the necessary commands for complex operations such as paging.

Users can make a quick Draft Print, change page settings then produce a high quality Final Print all from within +Windows.

Rounding off the new packages from Panda Discs is +Catalogue, a full auto-booted, menu driven information storage system for Wordwise Plus. It allows large amounts of information to be stored and searched using normal Wordwise-Plus files.

Subject to disc capacity, +Catalogue can automatically search up to 25 separate text files.

Each of the discs costs £9.95 including UK postage and packing. Panda Discs are at Four Seasons, Tinkers Lane, Brewood, Stafford, ST19 9DE.

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ovation

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Ovation has many advanced frame features, such as linked text frames with auto-flow, repel text, definable frame borders and a step-and-repeat facility. Unique on the Archimedes, is our parent/child system for frames and lines. This system allows you to copy and paste frames with embedded child frames and lines, as single items. This allows diagrams, forms, tables etc. to be copied or moved with ease.

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Ovation is supplied with a tutorial and complete user guide, although you probably won't need to refer to it very often. Ovation makes full use of the RISC OS multi-tasking environment to provide a formidable array of features that are easy to learn and instinctive to use. A quick reference card is also included, which lists all the keyboard and mouse short cuts.

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Make more music

USERS of The Hybrid Music System can now choose from 10 system packages. Hybrid Technology (0223 420360) have expanded and reorganised their range to allow even more scope for BBC Micros to be used in music education.

Their Basic Primary System includes the Music 5000 synthesiser and Universal software which allows standard classroom music software to produce high quality instrument sounds.

The Standard Primary System combines the synthesiser and Music 4000 keyboard with two new software packages, Soundscape and Soundscore and the Complete Primary System adds a Music 1000 amplifier, speakers and leads to provide stereo reproduction.

For special schools, Hybrid offer the Basic Special Needs system including the Music 5000 synthesiser and Soundspace while the Standard Special Needs System adds a Music 4000 keyboard which children can use alongside or instead of the touchscreen.

Also available are the Standard Special Needs system, The Complete Special Needs system and for secondary schools, The Expanded Secondary System.

Primary systems range in price from £99 to £481, the special needs systems from £128 to £481 and the secondary systems from £99 to £728.

New look at the planets

SINCE 1543 when Copernicus first broached the controversial view that the solar system revolved around the sun, many models have been constructed to prove the point.

Latest aid to seeing what goes on in the heavens is a program develped for Archimedes and BBC A3000 machines by Spacetech (0305 822753).

It's a computerised version of the elegant orrery, a finely engineered mechanism with many moving parts designed to show the movement of the solar system named after the fourth Earl of Orrery.

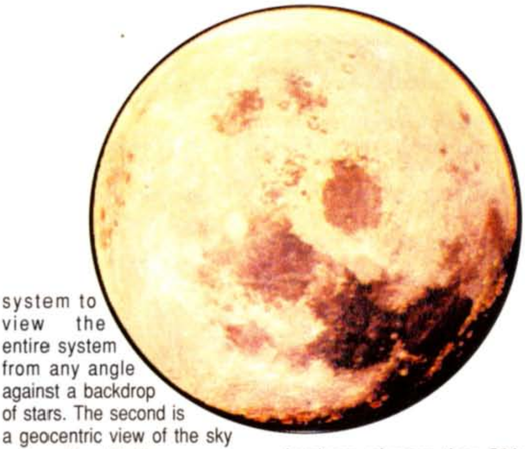
Orerry computerises the solar system and converts the Archimedes into a fully interactive productivity tool giving accurate and useful astronomical data for any time and date within a time frame of 4,000 years.

Two views are available. The heliocentric model puts observers outside the solar system to view the entire system from any angle against a backdrop of stars. The second is a geocentric view of the sky as seen from Earth.

Both views can be set up for any date and time then viewed as a fixed frame, animated in real-time or animated in accelerated time. Sections of the solar system can be zoomed for further detail.

The software runs entirely within Risc OS and has a database of more than 500 stars plus entensive information on each planet.

Screens can be output to disc or printer in the form of Draw, Paint or text files and Orrery is compatible with all Archimedes colour systems except A305 and with the A3000.



Colour coder for Arc

THE first standalone PAL colour coder for Archimedes machines has been launched by Ilford-based Pineapple Software (081 599 1476).

It enables a high quality colour video signal to be obtained from the computer which can then be recorded on to a video tape re corder or fed to a colour monitor with a composite input.

Pineapple claims to be responding to demands from users of the company's Video Digitiser who wish to record their results on VHS tapes.

Features of the PAL colour coder include:

- **No podule slot is required, as the device plugs into the RGB output socket and then provides a buffered RGB output to drive the Archimedes monitor as well as the coded video output.**
- **Sync pulses are completely regenerated by the coder to provide the correct CCIR waveform with the right number of broad and equalising pulses.**
- **A switch allows selection of either 624 or 625 line compatibility, making the unit suitable for either interlaced or no interlaced screen modes.**

Measuring 4.5in x 2.5in x 1.0in, the unit is priced at £69 plus VAT.

New networking system

LINGENUITY (0986 85477), the product division of Lindis International, has teamed up with software developers Software Solutions to produce what they claim is a major new networking solution for the Archimedes and BBC A3000.

Known as SCSI Share, it uses high speed SCSI protocols to allow a number of computers to simultaneously access a single hard drive via the Lingenuity SCSI interface at a low cost with a high bandwidth cable.

"SCSI Share is ideal for use in education where there are groups of floppy disc or Econet-based Archimedes or BBC A3000 computer systems", said Jack Lillingston of Lingenuity. "Once installed, SCSI Share can provide access to a whole range of applications at a speed of up to 70 times that available from Econet.

This means that several computers can load large applications simultaneously without the long delays familiar to Econet users".

SCSI Share will allow groups of up to seven computer users to benefit from the very fast SCSI data transfers because one hard disc is shared between the group.

As *The Micro User* went to press prices hadn't been fixed.

A3000 trend in education

ACORN's BBC A3000 is currently reversing a worrying trend in local education authority teacher training. In Sheffield, such training courses have been handed over to individual schools, resulting in a £100,000 underspend.

Take-up on the courses has dropped by an average of 40 per cent and in some cases is down to zero. The one exception to this is a series of induction courses for the A3000 which have been 300 per cent oversubscribed.

The popularity of the A3000 in Sheffield was welcomed by an Acorn spokesman who said that the trend was also being shown in many other parts of the country, proving the importance of the new machine to the education community.

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— for the Archimedes —

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Software — for the — Archimedes

Equasor

An equation building tool that complements many RISC OS applications, in particular DTP and word processor programs such as Impression and Impression Junior

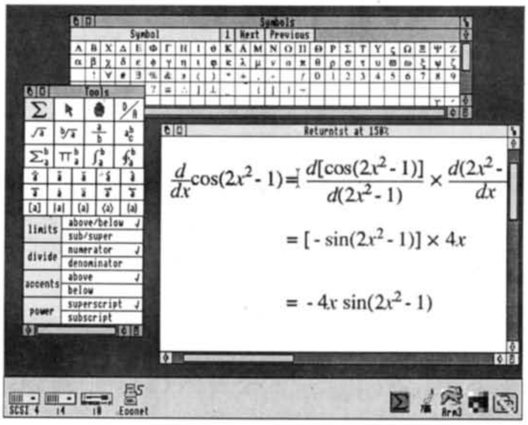
Many users of the Archimedes have a need to include complex mathematical formulae or equations into documents. Equasor allows equations to be built up on screen, graphically, from their component parts. Using the Acorn outline font system it presents a totally accurate view of the final equation at all times.

It simplifies the building of equations by presenting palettes of symbols, functions and operators which can be selected just by clicking with the mouse. It intelligently scales and re-sizes features such as summation symbols, brackets, and square roots as the equation is edited so they are always the right size.

Once the equation has been created it can be saved or exported as a Drawfile to any number of compatible RISC OS applications. In DTP packages it can be dropped into frames just like any other drawing where it can then be scaled and positioned as required.

When used in conjunction with Impression II, it can take advantage of the latter's embedded frame capability to embed equations into the text, even on the line. Once embedded in this way the equation will then flow with the text as part of the text.

Features:
Multi-tasking RISC OS application, can be run at the same time as other applications. Supports direct in-memory transfer of equations for the fastest, simplest integration with other RISC OS applications. Any number of equations can be handled at the same time. Equations can be viewed and edited at any scale. Saves equations as Drawfiles compatible with all applications that support this format. Supports multiple different RISC OS outline fonts and so is not limited to the Math/Greek font supplied.



$$\frac{d}{dx}\cos(2x^2-1)=\frac{d[\cos(2x^2-1)]}{d(2x^2-1)}\times\frac{d(2x^2-}{dx}$$

$$=[-\sin(2x^2-1)]\times 4x$$

$$=-4x\sin(2x^2-1)$$

- Supports region selection and cut, copy, paste between equations and documents.
- Styles for global control over fonts, size, spacing etc. of variables and operators.Effects give additional control over the appearance of individual parts of an equation.
- Small, compact program perfectly suitable for 1 Mbyte machines.

Included in package a 60 page spiral bound manual with detailed tutorial reference, and index. Discs include the program, example equations, and Math/Greek outline font.

£49.00+VAT *(£56.35 incl.)*

ShowPage

ShowPage is a PostScript compatible interpreter running under RISC OS. Over the last 6 years PostScript has established itself as an industry standard graphics programming language. Pioneered by Adobe for use in the original Apple laser printers it is now used in all manner of output devices such as colour printers, and typesetting machines.

ShowPage will be attractive to those wanting to learn and explore this programming language and those wanting to print and use PostScript files from other machines.

ShowPage is fully multi-tasking and RISC OS compatible. It can output any PostScript file either to a window on screen, or to the currently selected RISC OS printer. It can therefore be used to make even the lowest cost dot-matrix printer PostScript compatible. When used in conjunction with LaserDirect, it can turn this printer into a very fast and fully fledged PostScript compatible laser printer.

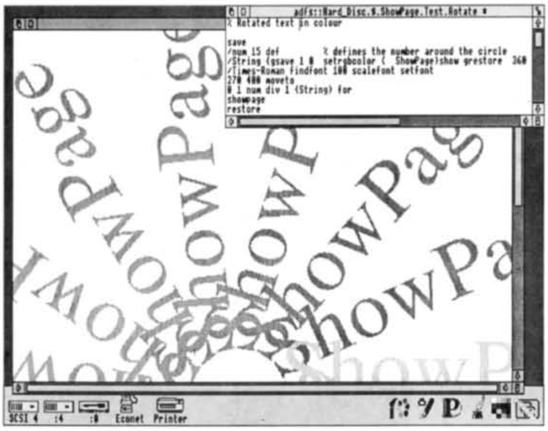
ShowPage supports the colour extensions and can create a sprite file of any required size. It can therefore be used to incorporate PostScript graphics into other RISC OS applications. It uses the RISC OS outline fonts, rather than the conventional PostScript fonts, for all rendering, so it is compatible with the wide range of Archimedes outline fonts now available for this computer.

ShowPage has a built in editor allowing PostScript programs to be created and executed directly, and interactively with the results shown on screen in another window.

Showpage is compatible with the output from Acorn PostScript printer drivers. Minimum recommended memory is 2Mbytes.

ShowPage can also be used with Laser-Direct to allow fast RISC 0S printing over Econet.

PostScript is a trademark of Adobe Systems Inc



```
% Rotated text in colour

save
/num 15 def          % defines the number around the circle
/String (gsave 1 0  setrgbcolor (  ShowPage)show grestore  360
/Times-Roman findfont 100 scalefont setfont
270 400 moveto
0 1 num div 1 (String) for
showpage
restore
```

Illustrates example ShowPage program and resultant output

Package includes a spiral bound manual detailing the ShowPage version of the language. 320 page PostScript language reference manual by Adobe. 240 page PostScript language tutorial manual by Adobe. Discs containing ShowPage and example programs. AvantG, BookM, Pembroke RISC OS outline fonts.

£149+VAT (£171.35 incl.)

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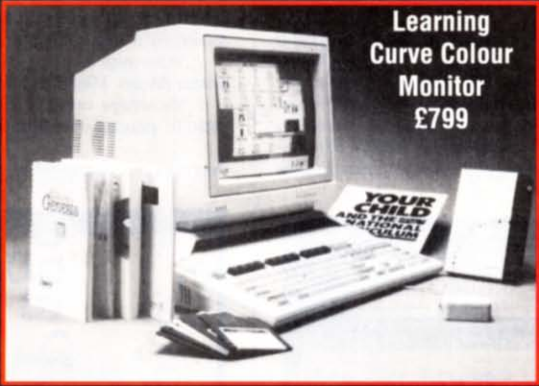

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Knowledge Organisation. It sounds so easy doesn't it, but it's surprising how difficult it is. Now, however, thanks to Clare's new program ***Knowledge Organiser***, it can all be very simple—Lawyers, Writers, Researchers, Lecturers, Students, Z88 users. Everyone who needs to organise, collect, collate and create will benefit from this revolutionary new program.

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The all new ***Artisan 2*** is now fully RISC OS compatible and makes full use of Windows, Icons and the Mouse in Mode 12. ***Artisan 2*** uses the full power of the Archimedes and the new Help Window makes this program a joy to use. ***Artisan 2*** has been hailed as the best of its kind and comes highly recommended. Remember the possibilities are endless.

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THE WIMP

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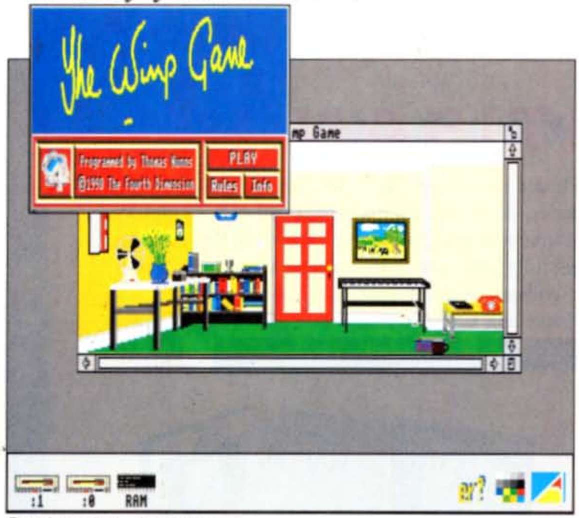


Don't be a wimp – break the vase

Price: £9.95
Supplier: 4th Dimension, 1 Percy Street, Sheffield S3 8AU.
Tel: 0742 700661
Requirements: BBC A3000 or Archimedes series

THE Wimp Game has been developed to celebrate 10 years of Acorn home micros, and throughout this time nothing has ever been published quite like it.

The Wimp (Windows, Icons, Mouse and Pointer) Game is based entirely on its title. Using the Risc OS environment, you work your way up from owning an Acorn Atom to a R240 workstation.

When you begin this completely multi-tasking game you are presented with a room etched in darkness. This is shown via a typical Risc OS window, with your pointer the touching instrument and the right hand key of the mouse a magnifying glass.

The first step is to provide illumination by clicking on the wall light switch and then you can see what's really happening.

Graphics-wise this game breaks no records, as it is only really played in Mode 12. The way you magnify anything on the screen is

I think you need a bit of light!

QUEST FOR MERLIN

... mission impossible

Price: £9.99 (5.25in disc) £10.99 (3.5in disc)
Supplier: Excalibur Software, 7, Granville Road, Gillingham, Kent ME7 2PB (mail order only)
Requirements: BBC B, B+, Master, Compact or Electron

I AM always on the lookout for new adventures, and particularly those issuing from amateur rather than professional software houses, so I ran the Quest for Merlin with eager anticipation.

I found a three-part adventure with a nice loading screen, some humour in the introduction, a vast choice of background and text colours – and then things fell apart.

The task is straightforward enough: Merlin has gone walkabout on account of his not fancying the amount he's supposed to stump up for his poll tax. The player has the unenviable task of locating him.

The documentation that came with Merlin was nonexistent: A map which conveyed absolutely no information whatever was the only thing supplied: It didn't even identify the starting location.

However, I persevered and plodded my way around, discovering items here and there, talking to various entities – and even kissing one of them. Hatters like to pucker-up and osculate from time to time.

What really hampered my progress was an almost impenetrable parser which – in spite of the authors' boasts – I found to be very limited indeed. The other thing which struck me forcibly was the price – rather high for a pedestrian text adventure.

I honestly can't recommend it unreservedly, unless you are desperate for a new adventure and have already bought Rainbow's End which I reviewed in January's issue of *The Micro User.*

Mad Hatter

Sound	*5*
Graphics	*5*
Playability	*6*
Value for money	*4*
Overall	*5*

DOMI

...double blank

Price: £2.99 (tape)
Supplier: Blue Ribbon Software, Nimrod House, Beckett Road, Doncaster DN2 4AD.
Tel: 0302 321134
Requirements: BBC B, B+, Master, Compact and Electron

IT'S certainly good to see continued support for the 8 bit range of Acorn computers from Blue Ribbon. Their latest release, Dominoes, contains versions of a couple of games, both old favourites in the world of pub and family entertainment.

They look similar on screen and have basic rules in common. The player and the computer are each dealt a hand of seven dominoes. The first player selects one of his tiles and plays it face up on the table.

Player two must then play one of his which matches one end of the first domino.

Play alternates, with a snake-like set of tiles building up, only ending when one player has used all of his tiles or when neither player can make a legal move. In the first game, Domino Out, the aim is to make sure that any tiles you have left at the end bear very few dots as they are totalled and added to the opponent's score.

Then a new hand is dealt and play continues until one player has reached the winning total of 61.

In the second game, Threes and Fives, the aim is to make the two ends of the snake have dots which add up to multiples of three or five.

For example, if there is a four at one end and a five at the other, the total is nine. Three goes into nine three times so the player who achieves this scores three points.

The ideal score is 15, which could be obtained with double six at one end and a three at the other. As 15 is three lots of five and five lots of three, this gives a score of eight.

As in the Domino Out game, the winner must score 61 points, and new hands are dealt until this is achieved.

The graphics in this computer version are generally tidy. The dominoes themselves are fine

GAME

pretty good though. On my first attempt I followed the instructions for the first few steps, but I advise you to stay clear of the fan as you really won't like what you end up as. I managed to reach the dizzy heights of being a Beeb owner, but I can assure you though that a pen and paper are essential.

I do have a couple of niggles: You must be very precise and if you drop anything vital it disappears and you must start all over again. This is the major fault as there is no save position or password facility.

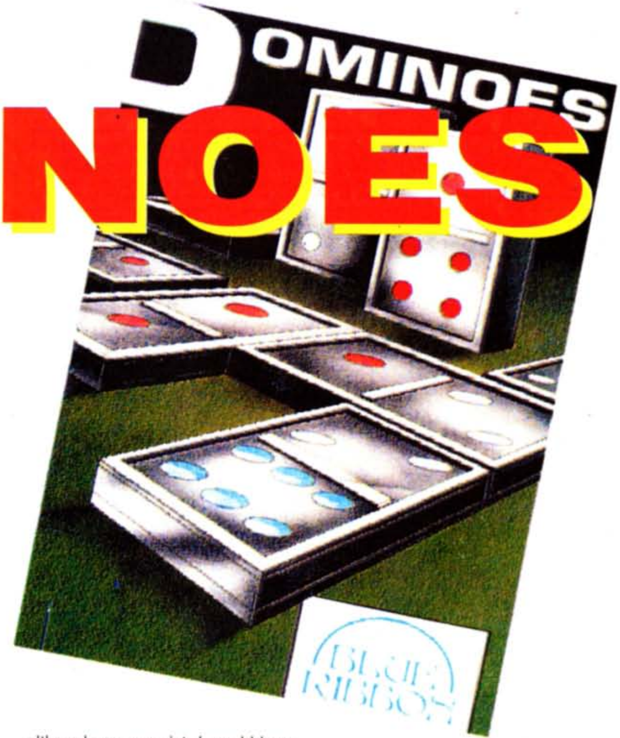
Luckily the game doesn't have that many locations, so it doesn't take you too long to regain your place. To sum up, The Wimp Game, is rather expensive considering the graphics and sound aren't much to look at, and at times you'll find it hard to progress, but the idea and niceties make it totally different.

I've seen similar games on the Apple Macintosh and I hope 4th Dimension take the Wimp Game along this route, as you'll be in for a real treat.

Brett Colley

Sound	*6*
Graphics	*7*
Playability	*7*
Value for money	*6*
Overall	*7*

NOES



although, as a purist, I would have preferred them to have round dots.

I like the board and pegs which are displayed for scoring. However, the on-screen text is rather cluttered and hard to read. The only advantage this game has over a set of dominoes is that it's a one player game with the adversary being a most adequate computer.

For me, it provides that mix of luck and skill which make for a good game. It could also provide arithmetic practice for youngsters. This game could entertain any member of a family from 8 to 80. Recommended.

Rog Frost

Sound	*N/A*
Graphics	*8*
Playability	*10*
Value for money	*10*
Overall	*9*

SQUARE ROUTE

YOU HAVE A TOP FIVE SCORE, PLEASE ENTER YOUR NAME

CHEAT MODE ACTIVE
F1=SKIP LEVEL F2=PAUSE ON/OFF

SQUARE ROUTE

Price: £19.95
Supplier: ComputerEyes,
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Street, Maidstone, Kent.
Tel: 0622 751096
Requirements: BBC A3000 ro
Archimedes series

COMPUTEREYES' first offering for the New Year is SquareRoute, an enhancement to the theme first started with Tetris. You must place randomly appearing white squares on a grid by moving and rotating them – or abandon the attempt and suffer a penalty.

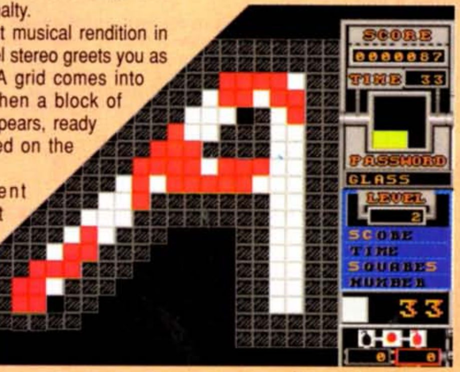
A brilliant musical rendition in four channel stereo greets you as you start. A grid comes into view and then a block of squares appears, ready to be placed on the grid.

Movement is via a set of redefinable keys and mouse control is available at any point. At the side of the game play is your score, time remaining and so on, as well as the orientation of the piece to place, which can be manoeuvred around.

Letters can be collected to build up words for bonuses, plus an option to collect certain letters so that you can apply for extra levels. Each of the many, many levels are different in every way, with bombs on some screens which have a timer counting down as well as your usual diminishing time.

SquareRoute is challenging and somehow different to any other game of its kind. ComputerEyes have certainly come up with a hit here, and with the help of password level jumping it's great. Go and get it!

Brett Colley



Tetris with a difference?

Sound	*8*
Graphics	*8*
Playability	*9*
Value for money	*9*
Overall	*9*

SOFTWARE Bargains AND Mercury Games

Archimedes Software Checklist Archimedes

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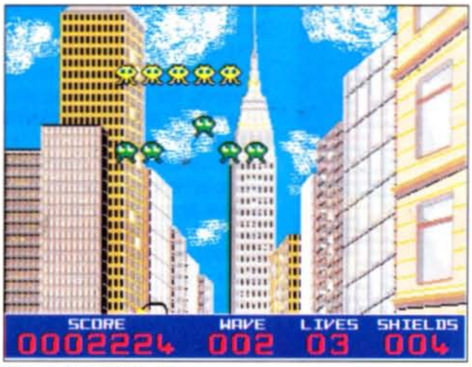
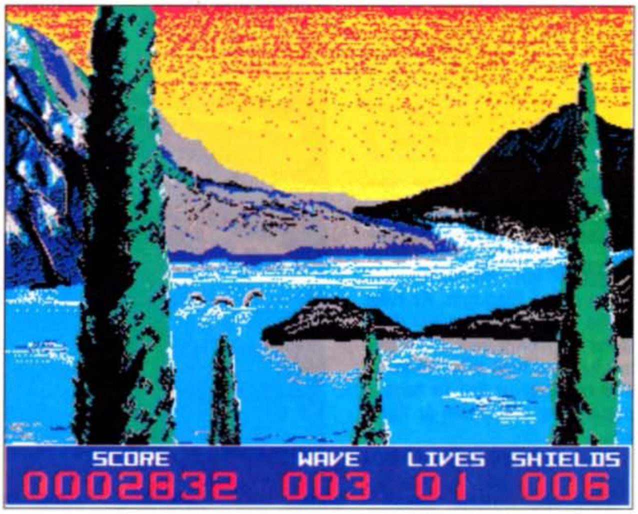


They're coming to get you

ALIEN INVASION



Protecting Loch Ness from Aliens?

... shoot 'em down

Price: £14.95
Supplier: Alien Images, 22 Warwick Street, Prestwich.
Tel: 061 773 8632
Requirements: BBC A3000 and Archimedes series

PICTURE the scene. It is sometime in 1978 and everybody is playing Space Invaders. The graphics and sound are a bit basic, but it's a superb game.

Fast forward to 1990, and you can play it again with superb graphics and real sounds courtesy of this Archimedes version from Alien Images.

In essence, this version is very similar to the old favourite: Alien craft descend from space and track back and forth across the screen. Some drop tiny bombs, trying to destroy your base, which can be moved left and right and can fire back at the aliens.

From time to time a supply ship passes overhead and it can be destroyed for bonus points.

The new game has, as you would expect, many refinements and improvements. The sprite graphics are very good indeed. Early screens have traditional aliens but as you progress to higher waves, new shapes appear.

These foreground graphics are really only half the story as the alien invasions take place against stunning graphical backdrops, four of which are provided. My favourite shows a New York style city sky line which adds a lot of atmosphere.

As with the graphics, so with the sound. The beeps of 1982 have become the digitised effects of 1990.

I often find computer game noises intrusive, but these are subtle and provide real help when playing. They can, of course, be turned off.

Another change is that the old fixed shields have gone. These were the barriers that were supposed to protect you but in fact just stopped you getting at the swarming spacecraft.

Now some kind of auto-shield has been fitted to your base. It is far more effective, but you lose some of the tactics of the original.

Also new are surprise items which drop from supply ships. Catching them can have good or bad effects ranging from instantly destroying remaining alien craft – a great help – through to making the aliens invisible, which is a bit of a disaster. It is possible to learn what these objects do and so evade the bad ones.

Players can select from four speeds, 122 sprites are used, with 1,000 passworded levels. If this is not enough for you then any part of the game can be edited.

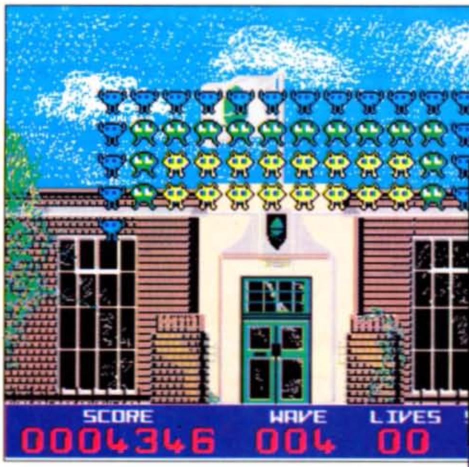
The sprite editor is fairly user-friendly but you will need to remember that some sprites have four variants. There is also a very straightforward wave editor which allows you to create your own formations containing different aliens, starting at any screen height and in any pattern.

Most impressive is the backdrop conversion program, which allows any Mode 12 screen or any Artisan screen to be used as a backdrop for the game. This gives scope to alter the whole character of the basic space invaders format.

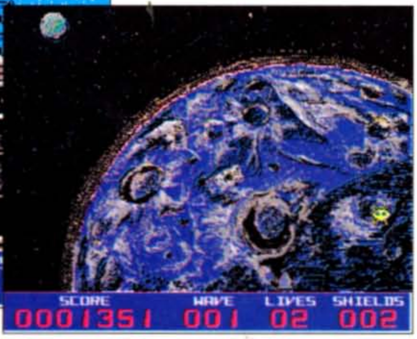
Alien Invasion is a classic. It is simple to play but requires skill to score well. Bright and colourful, it has a vast range of user options. Worth adding to your collection.

Rog Frost

Sound	*9*
Graphics	*9*
Playability	*9*
Value for money	*9*
Overall	*9*



Space Invaders was never so pretty



Price: £14.95 (disc) £12.95 (tape)
Supplier: Superior Software, P.O. Box 6, Brigg, South Humberside DN20 9NH.
Tel: 0652 58585
Requirements: BBC Micro, B+, Master, Compact and Electron

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SIM CITY

... a major triumph?

BBC Micro users who remember the original Welcome Pack software may have fond memories of a game called Kingdom. As ruler of the Kingdom you made decisions regarding how much rice to plant and how much to store, and whether or not to have a population of farmers or fighters.

The results of your decisions affected both your own population and the temperament of the neighbouring tribes. Sim City takes this relatively simple concept and enhances it beyond all recognition.

Last year the 16 bit versions of Sim City were scooping international awards for Best Game and Best Simulation. Now, courtesy of Superior Software, this mega game has found its way to the BBC Micro.

The objective of Sim City is to construct, manage and maintain a city of your own. To do this you must unravel and master the complex inter-relationships between human, economic, survival and political factors.

Believe me, after you've played this for a while you will never apply for a job in local government.

The Sim City screen is divided into two areas: The map display, around which you can scroll with the arrow keys, and the bank of icons at the foot of the screen. These are the tools with which you must work.

With a budget of £20,000 at your disposal you begin the construction of a new city. All such have humble beginnings, and yours is no different: A cluster of houses, an industrial plant or two, and a commercial zone in which to sell the goods – so far, so good.

As the village expands, the plain squares that you positioned on the map begin to develop: Houses, factories and shops appear as your policies encourage growth and development.

By striking the correct balance between residential, industrial and commercial zones, unemployment is kept low and the factories are not starved of labour.

Using these relatively simple tactics your city will survive for a while. As the population expands so does the criminal element, and you will have to establish and fund a police force. Similarly with fire prevention, people are discontented when they are not protected from the possible threat of fire.

Not only must you deal with the social aspects of human life, there are the economic factors to deal with.

Factories need raw materials if they are to develop, so their proximity to a port is advantageous. Ditto with power supplies, but should your power station be coal or nuclear powered?

How does the population get to work? Roads are cheap, but are easily congested, railways can cope with big populations, but are relatively expensive to run.

If you build the residential zones near to the factories the inhabitants are not happy and the price of the property remains low. Nice residential areas with parks and no factories have a higher value than those in the industrial heartland, and this value is reflected in the tax revenue collected.

The city's finances are monitored via the Budget screen, which displays such information as the current running costs for fire, police and transport services.

Your total annual expenditure is shown at the bottom of the screen and the annual income from tax collection is displayed at the top. If expenditure exceeds income you must take corrective action quickly if you are to avoid the downward spiral into oblivion.

As in the real world, taxes are an emotive subject and merely increasing the tax rate in an effort to boost your revenue is unlikely to prove a viable solution.

Industries tighten their belts, unemployment rises, people begin to move away from the city and the net effect will probably be a lower tax income than you attained before you put up the rate.

A tactic more likely to succeed is to try and make more people want to come and live in your city. Putting parks in and around your residential areas is a cheap way of boosting property values and making people happier.

If you have a little more cash to play with you could build a sports stadium, as these encourage residential growth and also pull in a fair amount of revenue.

The only problem is the volume of traffic they attract, forcing extra expenditure to keep traffic flowing.

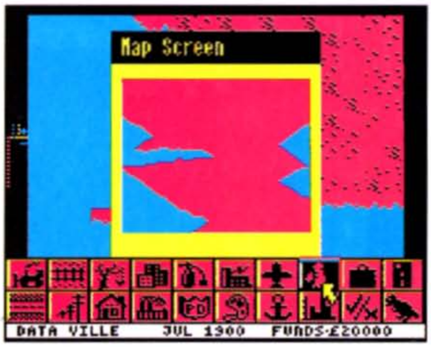
If the Budget screen provides information regarding your financial wellbeing, it is the Evaluation screen that highlights any problems that may be on the horizon.

This display contains an opinion poll on your popularity with the masses and also shows what aspects of city life are currently giving your residents cause for concern – ignore this display at your peril.

Sim City is a totally engrossing game that you will be playing for many months to come. Teachers should also note that this package would lend itself superbly to an educational environment.

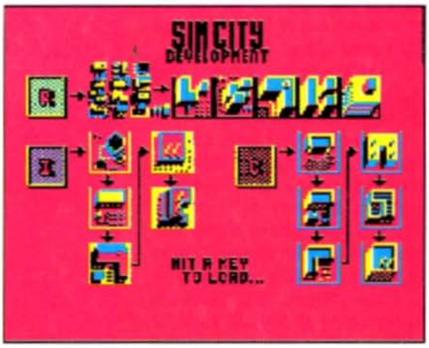
Jon Revis

Sound	*N/A*
Graphics	*8*
Playability	*10*
Value for money	*10*
Overall	*9*



DATA VILLE JUL 1900 FUNDS:£20000

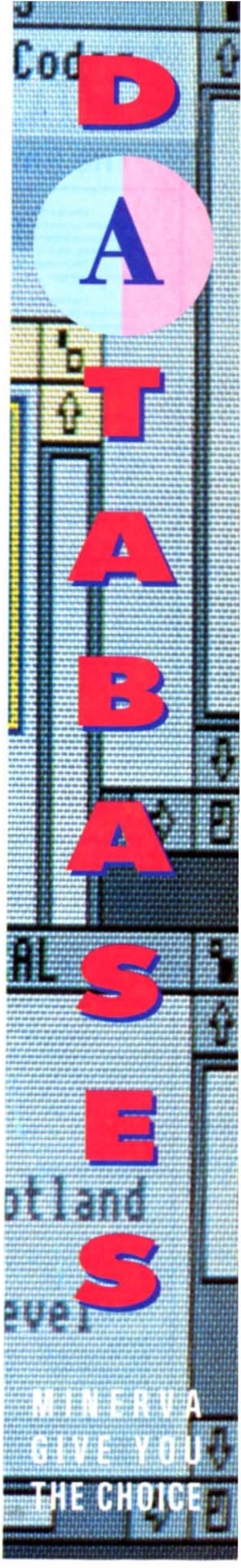
A peaceful sea resort or a disaster?

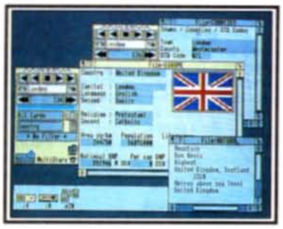


Icon based - but you'll need your wits

BUSINESS EDUCATION OR HOME DATABASES

MINERVA





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SYSTEM DELTAPLUS The database for the serious home user or enthusiast. System DeltaPlus is a comprehensive database giving you power coupled with ease of use. Easy to use video style controls and the ability to define your own card layouts make this database suitable for all types of data entry. Searches can be performed by simply selecting from within windows or by multiple criteria. Reports can be produced together with labels up to four across with blank line strip. With comprehensive maths, sorts and searches System DeltaPlus is hard to beat. System DeltaPlus may be programmed if required allowing you to customise the package or write your own applications. **£79.95 INC V.A.T.**

GRAPHBOX* **Data can be imported from the Minerva range of databases to GraphBox and stunning charts produced.**
With twenty different charts and graphs you will always be able to present your data to its best. GraphBox also imports data from other RISC OS packages. With a 'Hot Link' to Pipedream 3 which allows for automatic updating of graphs from data produced and the ability to export charts as draw files. Graph Box is the answer you have been looking for.

* *Graphbox is not a database, but can be used with any of the above programs for reproduction of charts and graphs.*

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PINEAPPLE SOFTWARE

The Pineapple Software Real Time Colour Video Digitiser

What is a Real Time Video Digitiser? There are quite a few different 'Digitisers' available for the Archimedes but very few can accurately claim to fit the above description. The requirements are that it must be able to 'grab' a single field of video information from a colour moving source, such as a video recorder, TV, or video camera, and then process the image and display it on the computer screen.

The Pineapple Digitiser does just this, – and at a price which is less than some Digitisers which can only handle static images.

HARDWARE

The hardware consists of a double width podule which fits inside a 300 or 400 series Archimedes, and comprises a PAL colour decoder, 256K memory and various control and interface circuitry. The PAL decoder converts the input signal from your TV or video recorder into separate red, green and blue signals. These are then converted into digital form and stored in the 256K ram in a format giving 512 pixels across the picture and 256 rows vertically. The video signal in the ram is constantly changing at the same rate as the incoming video picture until the podule receives a signal from the computer to 'freeze'. At this point the last picture in the ram is frozen and can be transfered to the computer screen in many different ways depending on which software commands are issued.

SOFTWARE

The software to drive the podule is supplied on disc in the form of a relocatable module. This provides a host of additional '*' commands and SWI's which can be used even by inexperienced programmers to produce very impressive displays of live pictures or ones previously saved on disc. For non-programmers, ready written programs are provided to explore all the features of the Digitiser and produce 'Sprite' images which can be used in many other applications and 'Art' packages. The software is very easy to use and scaling routines are provided which allow you to manipulate the grabbed image by selecting any part of the picture (using a box drawn on screen controlled by the mouse) and placing it on any area of the screen, again using a box to select the position and size. This enables multi-picture images to be produced very rapidly using either live pictures or ones you have previously saved on disc. The 80 page handbook provides full details of how to implement the commands even for the inexperienced programmer.

EDUCATION

The Digitiser has many uses in education. The software commands can show many of the effects typical of the digital storage of TV pictures which can help to explain the way in which TV works. It can also be used to produce powerful audio-visual displays tailored to your own requirements from images captured using video cameras etc. For younger children, programs can be created to help learning by giving high quality visual images of animals, birds, trees etc, built into a 'quiz' format. The possibilities here are endless.

FUN & GAMES

As well as showing off to all your friends who don't have an Archimedes, what a great computer it is, you can use the Digitiser to produce images for all sorts of games and visual demonstrations. Games such as 'Guess the Celebrity' or 'Guess the Advert' can be produced by even inexperienced programmers, simply by 'grabbing' all the necessary images from TV and saving to disc.

SPECIFICATION

Video Inputs	Pal coded video, .75 Volts – 2·5 Volts pk to pk R, G, B & sync input All inputs may be terminated by internal DIP switches.
Resolution	512 x 256 pixels
Storage system	Standard version 4 bits Red, 4 bits Green, 4 bits Blue – 192KRam Extended version 5 bits Red, 6 bits Green, 5 bits Blue – 256K Ram
Picture Area	The Digitiser harware allows the full screen area normally viewed to be stored in the podule ram. Horizontal shift, Vertical shift and width can be adjusted internally if required.
PAL Decoder	The PAL decoder provides manual control of Brightness, Contrast and Saturation, combined with full auto saturation control.

STOP PRESS! STOP PRESS! STOP PRESS! STOP PRESS! STOP PRESS! STOP PRESS!

Many new software applications are now supplied with the Digitiser including an excellent new icon based front end providing easy access to all the existing Digitiser features plus many new ones!

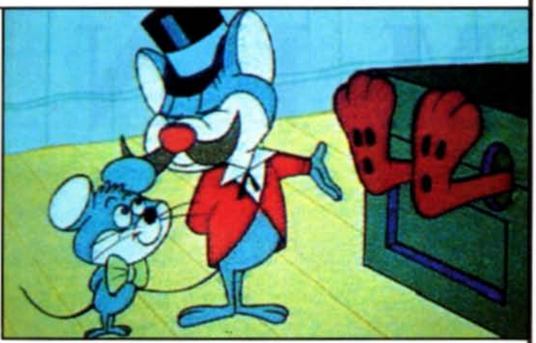
NEW! NEW! NEW! NEW! NEW! PAL COLOUR CODER

A new hardware product now available from Pineapple is a high quality colour coder unit. This unit produces a full coded video signal from the Archimedes computer which enables you to feed the output of the computer into a video recorder or second colour TV monitor.

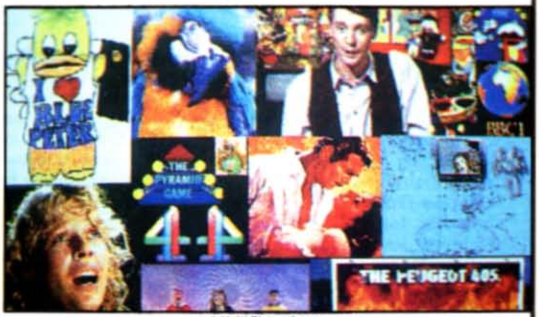
FEATURES:

1. External to computer - no podule slots required
2. Sync regeneration to provide correct broad pulse and equalising pulse wfm
3. Switch selectable to 624 or 625 line operation - for interlaced or non-interlaced screen modes
4. Plugs into RGB computer socket and provides buffered output to feed Archimedes monitior + coded signal output
5. Adaptable for use with other computers or RGB and Sync signal sources.

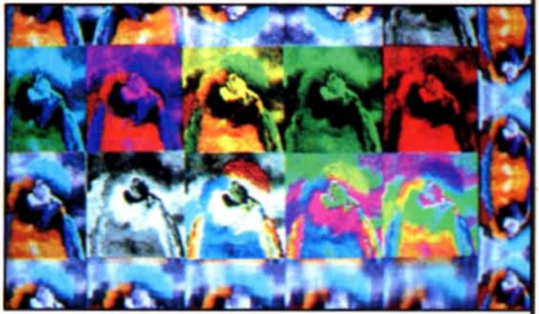
PRICE £69.00 + VAT. P&P FREE



Cartoon



A Multi Picture Image



Some Digitiser Effects

-'Pineapple has produced one of the 'ultimate' Computer Video Digitisers'-
-'The Pineapple Colour Digitiser looks to be one of the most professional products yet to be seen on the Archimedes'-

Acorn User - April 90

Digitiser Prices	
Standard	£285.00
Extended	£315.00
A3000 Adapter Box	£65.00

POSTAGE AND PACKING FREE

NEW LOW PRICES! **BBC PCB Designer** **NEW LOW PRICES!**

This ever popular ROM based PCB designer is suitable for all BBC Micros.
It's fast high-density 1:1 scale print routine allows prototype boards to be made directly from a printout, and a 2:1 scale print may also be used to produce professional quality boards. A second Eprom is optionally available to add a powerful auto-track routing facility to the program. This utilises a 'rats-nest' imput routine and allows any component to be 'picked-up' and moved around the board without having to re-specify component interconnection.

The full auto-route facilities are available even on a standard unexpanded Model B.

'PCB Autoroute is remarkable. No similar software comes near the price.'

Acorn User- Aug 88

PRICES	
Manual track routing	£55.00
Auto track routing	£85.00
Plotter Driver	£35.00
P&P FREE	

STILL AVAILABLE AT NEW DISCOUNTED PRICE!
DIAGRAM II £25.00!

ADFS Utilities Rom

ADU is an invaluable utility for all ADFS users. It adds over 22 new * commands to the ADFS filing system as well as providing an extensive menu facility with over 35 sub commands covering such areas as repeated disc compaction, saving and loading Rom images, auto booting of files, and many more. Transferring of files from DFS to ADFS is also made very easy

ADU .... £29.00 P&P FREE

Marconi Tracker Balls

RB2/101 Bare for BBC	£45.00
RB2/ 101+ With software	£50.00
RB2/115 Archimedes	£45.00
RB2/107 Atari ST	£45.00
RB2/109 Amiga	£45.00
RB2/110 Nimbus	£45.00
Mousetrak adapter to enable 101 and 101+ to work with Mouse software	£8.00
Postage and packing on Tracker Balls	£1.75

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A3000

0255g	A3000 Entry System	599.00
0256g	A3000 Colour System	798.00
0209g	JetSet Pack + TV Modulator	649.95
0220g	Learning Curve Entry	699.00
0221g	Learning Curve Colour	898.00

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Archimedes Computers

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0261g	410/1 Colour System	1298.00
0262g	420/1 Entry System	1265.00
0264g	420/1 Colour System	1464.00
0197g	420/1 Learning Curve Entry	1299.00
0198g	420/1 Learn. Curve Colour	1498.00
0275g	440/1 Entry System	1699.00
0276g	440/1 Colour System	1898.00
0194g	540/1 Entry System	2995.00
0195g	540/1 Colour System	3194.00

The official Acorn Colour Monitor (AKF12) is supplied with all Acorn Colour Systems as we believe the quality is superior to other, cheaper monitors.

SPECIAL FREE OFFERS:
A free RISCOS extra's disc, plus:

A3000 & Learning Curve (Not JetSet)
Beebug's high quality 1Mb RAM Board

Archimedes 410/1
20 Mb Drive & RAM upgraded to 2Mb

Archimedes Learning Curve (420/1)
Drive changed to 40Mb, RAM expanded to 4Mb

Archimedes 440/1
A Taxan 775 monitor (Entry system) or
a Star XB24-10 printer (Colour System)

Archimedes 540/1
Taxan 795 (or 775 if preferred) monitor (entry) or
a Star XB24-10 Colour Printer (Colour system)

Memory Upgrades

0266f	0.5Mb RAM for A305 (Acorn) *	139.00
0222g	1Mb A310 Upgrade (CJE) *	287.65
0223g	3Mb A310 Upgrade (CJE) *	444.17
0278d	1Mb RAM upgrade for A400 *	60.00
0813g	Atomwide 8Mb RAM *	850.00
0225f	A540 4Mb RAM Card *	469.00

Dealer fit only - Free fitting by appointment

Hard Drives (ST506)

0268g	A310 20Mb (Acorn)	379.00
0120g	A400/1 20Mb (Beebug)	173.87
0121g	A400/1 40Mb (Beebug)	284.30
0122g	A400/1 53Mb (Beebug)	399.00

SCSI Hard Drives for A300/400

Supplied complete with controller card.

0140g	20Mb Internal	375.00
0141g	45Mb Internal	495.00
0142g	80Mb Internal	699.00
0145g	20Mb External	535.00
0146g	45Mb External	655.00
0147g	80Mb External	859.00

Archimedes Upgrades

0795d	A310 5.25" disc buffer (B'bug)	28.91
0267e	A310 Floppy drive (2nd) *	114.95
0784d	A410/1 5.25" disc buffer	28.91
0279e	A410/1 Floppy drive (2nd)	119.95
0134f	ARM 3 30Mhz (Beebug) *	399.00
0269d	Backplane 2-way (Acorn)	37.00
0768d	Backplane 4-way inc fan (Ifel)	55.00
0236b	MEMC 1A upgrade *	65.48
0817b	VIDC Enhancer (Atomwide)	29.95
0139b	VIDC Mode Expander (B'bug)*	29.95

Archimedes Add-Ons

0716b	Archimedes Dust Cover	7.43
0832b	Keyboard Extension Lead	6.91

Archimedes Expansion Cards

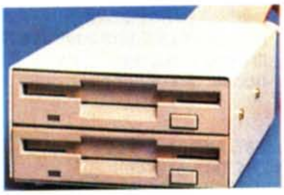
1950d	16 bit I/O card (Intell.Interf.)	199.00
0803d	A448A Mono sound sampler	135.00
0833d	A448B Stereo Sound Sampler	165.00
0834d	A448M Stereo + MIDI sampler	195.00
0265d	Floating Point Co-pro	559.95
0271d	I/O Podule (Acorn)	79.95
0272d	MIDI add-on to I/O podule	28.95
0273d	MIDI Podule (Acorn)	66.95
1948b	MIDI upgrade to Podule	15.00
0874g	Multipod Professional I/O	115.95
0158d	SCSI 16-bit card (Oak)	189.95
0870f	SCSI podule (Acorn)	279.95

Archimedes / A3000 General Add-Ons

0900b	PC Emulator (Acorn)	88.95
0794b	Spiral Keystrip Holder	2.56
1965g	Teletext Adaptor (Morley)	125.00

A3000 Memory Expansion

0133d	1Mb RAM Card (Beebug)	95.00
0130d	1Mb Upgradeable RAM card	105.00
0131f	3Mb RAM Card (Beebug)	249.00
0132f	1 to 3Mb Upgrade for 0130	155.00



A3000 External Disc Drives

1961g	External 3.5" drive (Morley)	125.00
0288g	External 5.25" drive (Morley)	169.00

NEW
Beebug's range of SCSI drives for the A3000

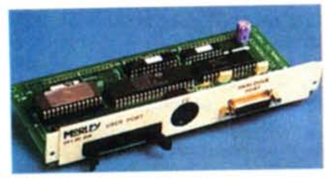
SCSI Hard Drives for A3000

Beebug drive. Supplied with internal controller card.

5200g	A3000 SCSI 20Mb	399.00
5201g	A3000 SCSI 45Mb	499.00
5202g	A3000 SCSI 80Mb	599.00
5203g	A3000 SCSI 180Mb 15.5ms	899.00

A3000 Add-Ons

0712b	A3000 Keyboard Dust Cover	4.30
0801e	Monitor Plinth (Acorn)	29.00
0896c	Podule case	14.96
0277a	Serial Chips *	19.00

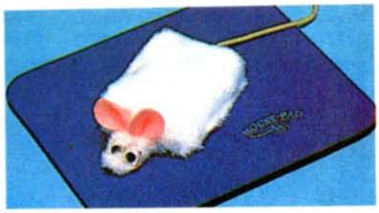


A3000 Expansion Cards

0234d	BBC A/D + User Port (Morley)	69.00
0135d	Disc Drive Interface (B'bug)	34.74
0136f	Disc Interface with SCSI	136.91
0238d	MIDI + I/O Podule (Acorn)	49.00
0137c	SCSI upgrade for code 0135	120.44

Scanners & Video Digitisers

1964g	I-Scan (Irlam Instruments)	579.00
1960f	Scan Light Junior A3000	189.00
1963g	Scan Light II (CC)	380.74
1962f	Scan Light Junior (CC)	176.95
0731g	Scavenger A4	342.60
0732f	Scavenger A4 Sheet Feeder	146.96
0730f	Scavenger A6	149.00
0735f	Scavenger A6 for A3000	175.00
0733f	Scavenger A4 for A3000	408.65
0878e	Hawk V9 Colour Digitiser	334.95
1952e	Pineapple Colour Digisiter	273.87



Joysticks and Mices

0723c	Deltacat Joysticks	24.74
0742c	Joystick adaptor Arch (RTFM)	34.99
0743c	Joystick adaptor A3000 (RTFM)	37.99
0722b	Joystick Controller (Serial Port)	20.83
6603c	Deluxe Quickshot Joystick	10.43
0696a	Furry Mouse Cover	6.91
0685b	Mouse House	2.60
0789b	Mouse Mat (blue)	3.04
0788b	Mouse Mat (red)	3.04

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0899b	1st Word Plus Version II	72.00
1170b	Easiword (Minerva)	33.95
1975b	Premier 3 (Circle Software)	70.00
5462b	Premier 3 WP application	23.00
1088b	Protext 5.0 (Arnor)	130.39

Spreadsheets

0954b	Intersheet II (CC)	24.95
1084d	Logistix (Acorn)	89.00
1998b	Schema (Clares)	107.35
0931b	Sigmasheet (Minerva)	43.44

DeskTop Publishing

1089c	Desk Top Publisher (Acorn)	125.00
1113c	Impression II (CC)	158.00
1115b	Impression Junior (CC)	89.00
1077b	Tempest (Clares)	125.00
0108b	Ovation (Beebug)	99.00

Integrated Packages

5427b	Desktop Office (Minerva)	109.95
0901d	Pipedream 3 (Colton)	125.00

Databases

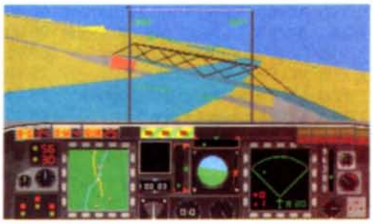
1913b	DataVision (Silicon Vision)	123.86
1992b	Flexifile (Minerva)	125.95
0987c	Flying Start II (Mitre)	84.95
1900b	Genesis (Software Solutions)	79.95
5460b.	Carousel (for Genesis)	39.95
5448b	Genindex (for Genesis)	29.95
0910b	Knowledge Organiser (Clares)	45.00
0100b	Masterfile II (Beebug)	19.13
0989d	Multistore (Minerva)	199.95
5447b	Squirrel (Digital Services)	129.00
0921c	System Delta Plus vII (Minerva)	55.00

Accounting Packages

5458d	Business Accounts (Minerva)	379.95
0947b	Home Accounts (Minerva)	40.00
1159c	MicroTrader Accounts	199.00
1916c	MicroTrader Stock Control	75.00
1914d	Office Tools (Silicon Vision)	299.95
1917b	Share Holder (Silicon Vision)	161.09

Arcade Games

1930b	Apocalypse (4th Dimension)	24.75
0997b	Arcade Soccer	17.00
54450b	Ballarena	17.35
1931b	Battle Tank (Minerva)	12.35
5455b	Blowpipe (Eclipse)	17.35
1978b	Break 147 (4th Dimension)	20.65
1995b	Chock Away (4th Dimension)	20.62
1187b	Conquerer (Superior)	19.00
0952b	Corruption	20.61
1979b	Drop Ship (4th Dimension)	16.48
1070b	E-Type (4th Dimension)	16.48
1058b	E-Type Designer (4th Dim.)	14.00
0999b	E-Type Extra 100 miles (4thD)	14.00
1929b	Fireball 2 (CIS)	21.70
0944b	Fish	20.64
1980b	Guild of Thieves	20.65
0964b	Holed Out (4th Dimension)	16.48
0993b	Holed Out Designer (4thD)	16.48
0991b	Holed Out Extra 1 (4thD)	14.00
0992b	Holed Out Extra 2 (4thD)	14.00
1984b	Hostages (Superior)	17.35
1901b	Inertia (4thD)	17.35
1993b	Interdictor II (Clares)	27.95
1902b	Man at Arms (4th Dimension)	17.35
1987b	Manchester United	16.48
1903b	Nevryon (4th Dimension)	17.35
0946b	Pacmania	16.48
1999b	Pysankie (4th Dimension)	16.48
1994b	Real McCoy (4th Dimension)	24.75
1991b	Redshift (Minerva)	14.83
1122b	Repton 3 (Superior)	16.48
1933b	Rotor (Arcana)	20.70
5451b	Starch	13.00
0990b	Stranded	24.74
1986b	Superior Golf & Construction	16.48
5452b	Superpool (4th Dimension)	17.35
0998b	The Olympics (4th Dimension)	16.48
1981b	The Pawn	20.65
0963b	Thundermonks (Minerva)	12.35
0994b	U.I.M. (4th Dimension)	24.74
1109b	White Magic II+designer	16.48
5453b	Wimp Game (4th Dimension)	17.35
5456b	Worldscape (Eclipse)	17.35
1179b	Zarch (Superior)	16.48



Languages

0938c	ABC Basic Compiler (Dabs)	84.95
0897c	ABX Utils for ABC (Dabs)	44.00
1085d	ANSI C release 3 (Acorn)	128.95
0107c	ISO C Dev. System (Beebug)	77.39

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1091b	Armadeus (Clares)	66.21
0904c	EMR Creations set (6 discs)	43.39
0948c	EMR Studio 24 Plus v2	164.35
1971b	EMR MicoStudio	68.70
0995d	Ilnspiration (Pandora)	260.00
0239f	Pandora PMI-4 Midi Interface	179.95
1997b	Rhapsody (Clares)	41.36
5457b	Tracker (Serial Port)	41.95

Utilities

1946b	ARC-DFS (Dabs)	24.74
0102a	DFS Reader (Beebug)	9.06
0106b	Hard Disc Companion (B'bug)	33.91
5445b	Investigator II (Serial Port)	24.30
1990b	PC Access (Minerva)	33.91
0796b	Serial Link Disc (Beebug)	15.79
1908b	Star LC10 Colour Driver (Ace)	14.95

CAD

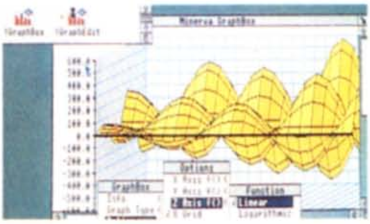
0911c	Autosketch II	75.00
0913c	PCB + autorouting	161.95
1909d	PCB Proffessional	310.95
0959d	P.D.T. (Oak)	349.95
1936c	WorraCAD (Oak)	73.95

Drawing / Painting

1103c	Artisan II (Clares)	54.95
0962b	Atelier (Minerva)	79.95
0937c	Pro-Artisan (Clares)	79.95

Graphics Manipulation

1976b	FontFX	10.00
1938c	Mogul (Ace)	19.00
19143b	Poster (4mation)	84.95
1078c	Render Bender (Clares)	58.00
1912c	Solids Render (Silicon Vision)	123.87



Presentation Graphics

0932c	GammaPlot (Minerva)	49.95
0912c	Graph Box Inc Hotlink (Min.)	64.00
0908b	Presenter II inc Hotlink (Lindis)	46.95
5429c	Presenter Story (Lindis)	159.00

Outline Fonts

1920b	Font Starter Pack (Acorn)	40.95
1921b	Newhall Font Pack (Acorn)	40.95
1922b	Symbol Font Pack (Acorn)	40.95
0111b	Outline Font Pack 1 (Beebug)	47.39

Educational Software

1008c	Desk Top Stories (Resource)	32.95
0935b	Dread Dragon Droom	25.95
1193b	Fun School II (0-6 years)	16.48
1194b	Fun School II (6-8 years)	16.48
1195b	Fun School II (8+ years)	16.48
1150c	Jigsaw (4mation)	29.00

Books

There is no VAT to pay on books

1211b	Arch Assembly Language	12.95
1246b	Archimedes First Steps	9.95
1243c	Arch Operating System	14.95
1208b	Basic V : A Dabhand Guide	9.95
1245g	RISCOS Prog. Ref. Manual	79.00
1207c	30 Hour Basic	12.95

Communications

3110f	Amstrad SM2400 Modem	217.35
0779f	Linnet Modem	120.83
0101d	Hearsay comms Software	60.00

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A high performance V22/V23 modem complete with Archimedes lead.
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All ribbons are manufacturers originals.

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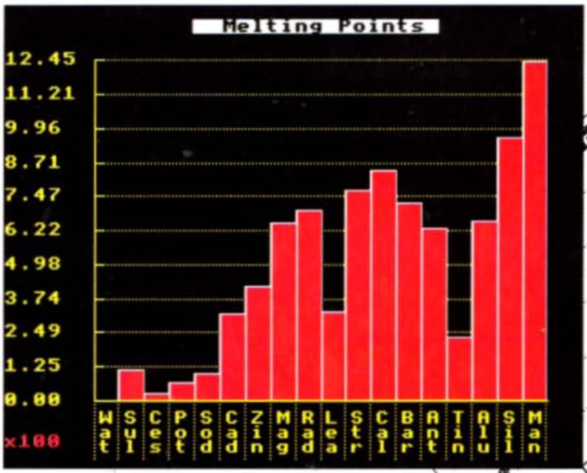

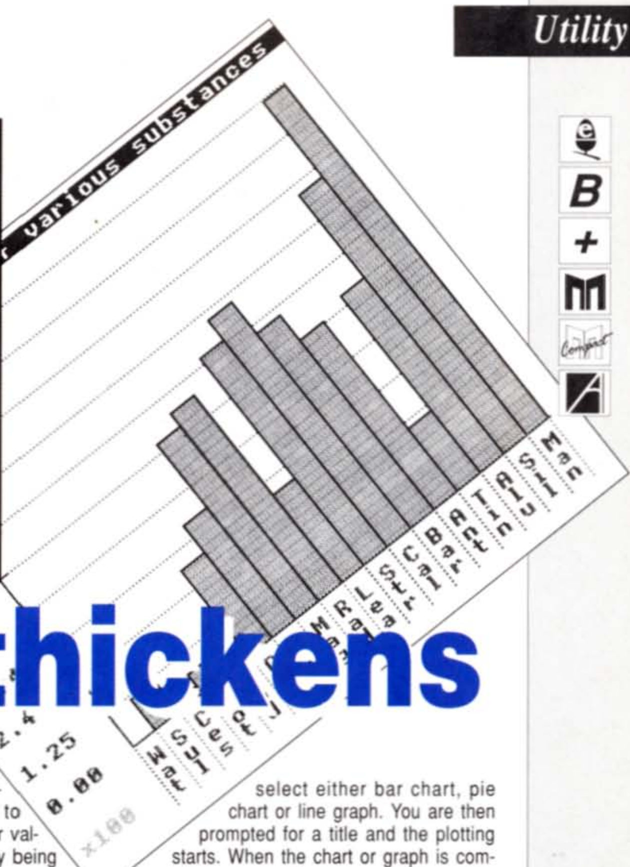

The plot thickens

Producing graphs becomes easy with Rafael Jay's excellent utility

PRESENTING complex data in such a way as to be understandable at a glance is a problem which businesses, schools and individuals often face.

A long list of figures and statistics can soon give you a headache as you struggle to spot trends and draw conclusions – but "a picture is worth 1,000 words", so why not turn it into a graph?

With a bar chart, pie chart or line graph you can immediately see how sales figures have risen over the past two months, or that your share of the market has increased.

Graph Plotter is a powerful program which transforms lists of figures into the three main graphs. Type it in and ensure it's correct using the checksums, save and then run it.

The main menu consists of eight options which you can highlight using the : and / keys to move up and down – press Return when your choice is highlighted. Pressing Escape at any point in the program will take you back to the main menu.

Before you can plot any graphs or charts, you will first need to enter the data. This can either be done by loading a pre-saved file, or by typing it in from the keyboard. The maximum number of data items is 17 – the data entry routine would have to be modified to increase this figure.

Entering data from the keyboard is easy. Select *Edit Data* from the main menu and you will see the editing display. You are prompted to enter either field names or values, with the cell currently being operated on highlighted.

Press Return if you wish to move on to the next cell without altering the contents of the current one. When you have finished editing press Escape to exit.

At this point it is a good idea to save your data, as you often need to update or correct the original entries, and after the graph has been plotted and printed, saving the data for future use is often neglected.

Files can be loaded and saved by making the relevent selections from the menu. You are prompted for a filename, which should include any drive and/or directory specifications.

The saved data is held in Basic's PRINT# and INPUT# format so if you are importing data from elsewhere you'll have to convert it to this first, or type it all in again. Once your data is entered, you can select either bar chart, pie chart or line graph. You are then prompted for a title and the plotting starts. When the chart or graph is complete you can either press S to save the screen to disc, P to dump the graph to a printer, or Space to return to the menu.

No printer dump is included in Graph Plotter itself because of the different options available. If you want to produce a hard copy, you must include the necessary command for dumping in PROCdump.

The final option allows you to enter any star commands, although on the 8 bit machines you mustn't use memory-corrupting commands like COMPACT or BACKUP.

You can use it to catalogue discs and alter the default directory, also it allows you to exit the program: Use *Basic on the 8 bit BBC Micros and *Quit on the Archimedes and BBC A3000.

● *And there you have it, a simple to use but remarkably powerful utility for handling all your graphing needs.*

```
   10 REM Graph Plotter
   20 REM by Rafael Jay
   30 REM (c) The Micro User
   40 PROCinit:ONERRORPROCerror
   50 MODE7:PROCoff
   60 os%=INKEY-256=161:IFos%DIMZ%256,Q%
256:ELSEZ%=&700:Q%=&70
   70 C%=FNmenu:CLS:PROCt(d$(C%))
   80 ON C% GOTO90,100,110,120,130,140,1
50,160
   90 PROCedit:GOTO50
  100 MODE1:PROCbar:GOTO50
  110 MODE1:PROCpie:GOTO50
  120 MODE1:PROCline:GOTO50
  130 PROCload:GOTO50
  140 PROCsave:GOTO50
  150 PROCclear:GOTO50
  160 PROCcli:GOTO50
  170 DEFPROCoff:VDU23,1,0;0;0;0;:ENDP
ROC
  180 DEFPROCon:VDU23,1,1;0;0;0;:ENDPR
OC
  190 DEFFNmenu:PROCoff:VDU26
  200 FORL%=0TO1:VDU31,0,L%,129,157,131,
141
  210 PRINT"Graph Plotter"SPC3CHR$156:NE
XT
  220 PRINTTAB(0,2)CHR$145STRING$(38,","
)TAB(0,24)CHR$145STRING$(38,",");:PROCt(
"Main Menu"):PRINT
  230 PRINTTAB(5)CHR$132CHR$157SPC(32-PO
S)CHR$156
  240 FORI%=1TOD%:FORL%=0TO1
  250 PRINTTAB(5)CHR$132CHR$157SPC(2)CHR
$134CHR$141d$(I%)SPC(32-POS)CHR$156
  260 NEXT:NEXT
  270 PRINTTAB(5)CHR$132CHR$157SPC(32-PO
S)CHR$156:P%=1:OP%=1:PROCh
  280 REPEATG$=GET$:OP%=P%
  290 IFINSTR(":;""'",G$) IFP%>1 P%=P%-1
:PROCh
  300 IFINSTR("?/",G$) IFP%<8 P%=P%+1:PR
```

➤

```
OCh
  310 UNTILG$=CHR$13:=P%
  320 DEFPROCt(T$)VDU26:FORL%=0TO1
  330 PRINTTAB(23,L%)CHR$131CHR$141;T$
  340 NEXT:VDU28,0,23,39,3:ENDPROC
  350 DEFPROCh
  360 VDU31,5,2+(OP%-1)*2,132,10,8,132
  370 VDU31,9,2+(OP%-1)*2,134,10,8,134
  380 VDU31,5,2+(P%-1)*2,134,10,8,134
  390 VDU31,9,2+(P%-1)*2,132,10,8,132
  400 ENDPROC
  410 DEFPROCinit:READD%:mr%=17:*FX4,1
  420 DIMdata$(mr%),data(mr%),d$(D%)
  430 FORI%=1TOD%:READd$(I%):NEXT:ENDPRO
C
  440 DATA 8,Edit data,Plot bar chart,Pl
ot pie chart,Plot line graph,Load data,S
ave data,Clear data,* Command
  450 DEFPROCedit
  460 FORL%=1TO18:PRINTTAB(0,L%)CHR$129C
HR$157CHR$131SPC(19-POS)CHR$156SPC(3)CHR
$132CHR$157CHR$135SPC(13)CHR$156:NEXT:VD
U30
  470 PRINT" Fieldname"SPC(14);"Value"
  480 FORL%=0TOmr%:IFdata$(L%)>""VDU31,3
,L%+1:PRINTdata$(L%);:VDU31,26,L%+1:PRIN
T;data(L%) ELSEPRINT
  490 NEXT:P%=1:REPEAT:B%=FALSE
  500 VDU31,0,P%,134,9,132:PRINTTAB(1,20
);"Enter fieldname ";P%;": "SPC(15);STRI
NG$(15,CHR$8);:F$=FNii(14)
  510 VDU31,0,P%,129,9,131:IFF$>""data$(
P%-1)=F$:PRINTTAB(3,P%);F$+STRING$(14-LE
N(F$)," ");
  520 VDU31,23,P%,134,9,132:PRINTTAB(1,2
0);"Enter value ";P%;": "SPC(20);STRING$
(20,CHR$8);:V$=FNii(10)
  530 VDU31,23,P%,132,9,135:IFV$>""data(
P%-1)=VALV$:PRINTTAB(26,P%);data(P%-1);S
TRING$(10-LEN(V$)," ")
  540 P%=P%+1:IFP%>18 P%=1
  550 UNTILFALSE:ENDPROC
  560 DEFFNi(T$,N%)PRINT'" "T$;:IFT$<>"*
"PRINT": ";
  570 =FNii(N%)
  580 DEFFNii(N%)PROCon:i$="":REPEAT:G%=
GET
  590 IFG%>31IFG%<127IFLENi$<N%i$=i$+CHR
$G%:VDUG%
  600 IFG%=127IFi$>""i$=LEFT$(i$,LENi$-1
):VDUG%
  610 UNTILG%=13:PROCoff:=i$
  620 DEFPROCerror:IFERR=17 ENDPROC
  630 IFos%e$=REPORT$ELSER%=(!&FD AND&FF
FF)+1:e$="":REPEATe$=e$+CHR$?R%:R%=R%+1:
UNTIL?R%=0
  640 e$=CHR$135+e$+CHR$145:VDU26
  650 PRINTTAB(20-LENe$/2,24)e$;
  660 VDU7:REPEATUNTILINKEY-99
  670 VDU28,0,23,39,3:ENDPROC
  680 DEFPROCcli:REPEAT$Z%=FNi("*",240):
VDU14:PRINT
  690 X%=Z%:Y%=Z%DIV256:CALL&FFF7:VDU15:
UNTIL$Z%="":ENDPROC
  700 DEFPROCclear:IFNOTFNq("Are you sur
e")ENDPROC
  710 FORL%=0TOmr%:data$(L%)="":data(L%)
=0:NEXT:ENDPROC
  720 DEFPROCsave:$Z%=FNi("Enter filenam
e",60)
  730 !Q%=Z%:A%=&05:X%=Q%:Y%=Q%DIV256
  740 IFUSR(&FFDD)AND&FF IFNOTFNq("Overw
rite existing file")ENDPROC
  750 F%=OPENOUT($Z%):FORL%=0TOmr%
  760 PRINT#F%,data$(L%),data(L%)
  770 NEXT:CLOSE#F%:ENDPROC
  780 DEFPROCload:$Z%=FNi("Enter filenam
e",60)
  790 F%=OPENIN($Z%):IFF%=0:VDU7:ENDPROC
  800 FORL%=0TOmr%:INPUT#F%,data$(L%),da
ta(L%)
  810 NEXT:CLOSE#F%:ENDPROC
  820 DEFFNq(T$)PRINT'" "T$" (y/n) ? ";
  830 REPEATG$=GET$:I%=INSTR("YyNn",G$)
  840 UNTILI%>0:PRINTG$:=I%<3
  850 DEFPROCscale:T=0:B=0:FORL%=0TOmr%
  860 IFdata(L%)>T T=data(L%)
  870 IFdata(L%)<B B=data(L%)
  880 NEXT:GCOL0,2:MOVE200,900
  890 DRAW200,150:DRAW1200,150
  900 B=INT(B):T=INT(T)+1
  910 R=T-B:CV=750/R:TMS%=1
  920 REPEAT:IFR>100 R=R/10:TMS%=TMS%*10
  930 UNTILR<100:C=0
  940 ST=R/10:FORL%=150TO900 STEP75
  950 MOVE200,L%:DRAW220,L%
  960 PLOT21,1200,L%:VDU5:MOVE0,L%+16
  970 PRINT;C:C=C+ST:NEXT:GCOL0,1
  980 MOVE0,75:@%=&90A:PRINT"x";TMS%
  990 VDU4:@%=&20206:ENDPROC
 1000 DEFFNcount(J%):C%=0:FORL%=0TOmr%
 1010 IFdata$(L%)>""C%=C%+1
 1020 NEXT:IFC%=0 =C%
 1030 SZ=1000/(C%-J%):P=200:=C%
 1040 DEFPROCbar:T$=FNi("Title",36):CLS
 1050 N%=FNcount(0):IFN%=0 VDU7:ENDPROC
 1060 @%=&20206:PROCscale:FORL%=0TOmr%
 1070 Y=150+data(L%)*CV:IFdata$(L%)>""GC
OL0,1:MOVEP,150:MOVEP,Y:PLOT85,P+SZ,150:
PLOT85,P+SZ,Y:GCOL0,3:MOVEP,150:DRAWP,Y:
DRAWP+SZ,Y:DRAWP+SZ,150:GCOL0,2
 1080 DRAWP,150:PLOT21,P,20
 1090 MOVEP+SZ,150:PLOT21,P+SZ,20
 1100 PROClab(1):P=P+SZ:NEXT
 1110 IFT$>""PROCtitle
 1120 @%=&90A:PROCopts:ENDPROC
 1130 DEFPROCtitle:COLOUR131:COLOUR0
 1140 PRINTTAB(20-LENT$/2,1)SPC2T$SPC1
 1150 ENDPROC
 1160 DEFPROClab(O%)GCOL0,2
 1170 A%=&0D:X%=Q%:Y%=&00:CALL&FFF1
 1180 XP%=Q%!4 AND&FFFF
 1190 YP%=Q%!6 AND&FFFF:VDU5
 1200 IFO%=1K%=3:FORU%=62TO126 STEP32:MO
VEP+(SZ-32)/2,U%:VDUASCMID$(data$(L%),K%
):K%=K%-1:NEXT:VDU4
 1210 IFO%=2K%=3:FORU%=62TO126 STEP32:MO
VEP-16,U%:VDUASCMID$(data$(L%),K%):K%=K%
-1:NEXT:VDU4
 1220 MOVEXP%,YP%:ENDPROC
 1230 DEFPROCline:T$=FNi("Title",36):CLS
 1240 N%=FNcount(1):IFN%=0 VDU7:ENDPROC
 1250 @%=&20206:PROCscale:MOVE200,150+da
ta(0)*CV:FORL%=0TOmr%
 1260 Y=150+data(L%)*CV:IFdata$(L%)>""GC
OL0,3:DRAWP,Y
 1270 GCOL0,2:MOVEP,150:DRAWP,170
 1280 MOVEP,Y:PROClab(2):P=P+SZ:NEXT
 1290 IFT$>""PROCtitle
 1300 @%=&90A:PROCopts:ENDPROC
 1310 DEFPROCpie:T$=FNi("Title",36):CLS
 1320 T=0:FORL%=0TOmr%:IFdata$(L%)>""T=T
+data(L%)
 1330 NEXT:IFT=0 VDU7:ENDPROC
 1340 0=360/T:VDU29,480;512;:MOVE0,400
 1350 FORD=0TO360STEP4:MOVE0,0:GCOL0,1:P
LOT85,SINRAD(D)*400,COSRAD(D)*400:NEXT
 1360 GCOL0,2:MOVE0,0:DRAW0,400:N=0:F=0:
GCOL0,2:FORD=0TO360
 1370 DRAWSINRADD*400,COSRADD*400
 1380 IFD>=F+data(N)*0 MOVE0,0:DRAWSINRA
DD*400,COSRADD*400:PROCpl:F=D:N=N+1
 1390 NEXT:PROCpl:GCOL0,2:FORL%=1TO(N+1)
 1400 MOVE490,408-L%*40:DRAW799,408-L%*4
0:DRAW799,448-L%*40:DRAW490,448-L%*40:DR
AW490,408-L%*40:NEXT
 1410 MOVE536,408:DRAW536,408-(N+1)*40:I
FT$>""PROCtitle
 1420 PROCopts:ENDPROC
 1430 DEFPROCpl
 1440 A=SINRAD(F+data(N)*0/2)*430
 1450 B=COSRAD(F+data(N)*0/2)*430
 1460 VDU5:MOVEA,B
 1470 GCOL0,3:MOVEA,B:IFD>180 VDU8
 1480 VDU65+N:MOVE500,400-N*40
 1490 VDU65+N,32:PRINTLEFT$(data$(N),7)
 1500 VDU4:GCOL0,2
 1510 MOVESINRADD*400,COSRADD*400
 1520 ENDPROC
 1530 DEFPROCopts:REPEATG%=GET
 1540 IF G%=ASC"P" PROCdump
 1550 IF G%=ASC"S" PROCsvg
 1560 UNTILG%=32:ENDPROC
 1570 DEFPROCdump
 1580 REM
 1590 REM Insert printer dump
 1600 REM command here
 1610 REM
 1620 ENDPROC
 1630 DEFPROCsvg
 1640 IFNOTos%:*SAVE GRAPH 3000 8000
 1650 IFos%:*SCREENSAVE GRAPH
 1660 ENDPROC
```

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If you prefer to save the wear and tear on your fingers you'll find this listing – together with all the others from this issue – on this month's disc, sent free if you subscribe to *The Micro User*.

```
  10 =    0 0  |  290 = 8A35 9  |  570 = 4A52 C  |  850 = 4A9D 6  | 1130 = 6F3E 8  | 1410 =  74E 9
  20 =    0 0  |  300 = 19F1 D  |  580 = F498 B  |  860 = E396 2  | 1140 = 1026 B  | 1420 = C66B 4
  30 =    0 0  |  310 = 7553 E  |  590 = FBB9 F  |  870 = B217 A  | 1150 = ED0F 1  | 1430 = B9C4 8
  40 = F63F F  |  320 =  4CD 5  |  600 = CAE4 3  |  880 = F922 3  | 1160 = 4AE7 F  | 1440 = E85C C
  50 = 96D2 0  |  330 = CB7F 1  |  610 =  E32 4  |  890 = 4868 3  | 1170 = DC77 7  | 1450 = 59FA A
  60 = B6D9 C  |  340 =  AB8 E  |  620 = 2C03 9  |  900 = 9EAC 9  | 1180 = AEE4 A  | 1460 = 7E8F F
  70 = 4246 7  |  350 = BFC8 F  |  630 = 27FD C  |  910 = B9A1 A  | 1190 = 4E77 4  | 1470 = 4CEC 7
  80 = 9190 C  |  360 = A0CE F  |  640 = 9710 E  |  920 = 4A04 6  | 1200 = AD9A 3  | 1480 = 72D2 5
  90 = 1FAA F  |  370 = 11DC 8  |  650 = 7D65 D  |  930 = A90E 6  | 1210 = 8B7D 2  | 1490 = B94B 5
 100 = A516 C  |  380 = 1796 7  |  660 = 295A A  |  940 = F286 3  | 1220 = 2D49 F  | 1500 = C22B 3
 110 =   6A 7  |  390 =  FFC 8  |  670 = 5E3E C  |  950 = 9F67 A  | 1230 = 20E3 0  | 1510 = E0EC 2
 120 = 915E 0  |  400 = ED0F E  |  680 = B587 3  |  960 = 773A D  | 1240 = A30C B  | 1520 = ED0F 0
 130 = 17BE B  |  410 = 5B08 F  |  690 = 6016 7  |  970 = 4D17 F  | 1250 =   31 0  | 1530 = E342 8
 140 = E423 8  |  420 = C884 1  |  700 = 1206 C  |  980 = 8448 E  | 1260 = BF05 0  | 1540 =  71C 3
 150 = 425D 1  |  430 = 32AE 2  |  710 = 21CA 7  |  990 = ECA8 4  | 1270 = 4253 1  | 1550 =  FBC A
 160 = C51D D  |  440 = 8545 D  |  720 = B78F 7  | 1000 = 6235 B  | 1280 = 8067 1  | 1560 = 9F7D E
 170 = 98CC 8  |  450 = BCBF D  |  730 = 93F7 E  | 1010 = 4A56 7  | 1290 = EA66 6  | 1570 = 3218 A
 180 = CC7C 4  |  460 = C260 0  |  740 = 2475 F  | 1020 = 5BD4 7  | 1300 = A9FE 8  | 1580 =    0 A
 190 = 2F05 1  |  470 = 8BC5 1  |  750 = 672A A  | 1030 = 9806 7  | 1310 = 18DB 1  | 1590 =    0 A
 200 = 7DBB 6  |  480 = 5336 5  |  760 = 64A1 1  | 1040 = 3B55 C  | 1320 = BF51 2  | 1600 =    0 A
 210 = F141 F  |  490 = A629 C  |  770 = A5CC 1  | 1050 = E66F 5  | 1330 = C435 E  | 1610 =    0 A
 220 = 83A9 D  |  500 = DA87 1  |  780 = 7CD9 5  | 1060 = D719 1  | 1340 = F900 E  | 1620 = ED0F A
 230 = 31F5 8  |  510 = F682 0  |  790 = 16F2 5  | 1070 = C66E 6  | 1350 = C9D5 D  | 1630 = 5B5B 4
 240 = 5FC7 2  |  520 = 3E87 1  |  800 =  E36 2  | 1080 = 7531 B  | 1360 = 9628 B  | 1640 =  A92 3
 250 = 7360 0  |  530 = C2FE D  |  810 = A5CC 7  | 1090 = 75BF 1  | 1370 = 6DBF A  | 1650 = 8190 5
 260 = 24BD F  |  540 = 1282 8  |  820 = 185C 7  | 1100 = 923D F  | 1380 = 1A6D D  | 1660 = ED0F D
 270 = 8D60 E  |  550 = 4556 7  |  830 = 371B 6  | 1110 = EA66 6  | 1390 = BC0B 8  |
 280 = 30F8 2  |  560 = 8E38 0  |  840 = B55B 2  | 1120 = A9FE 2  | 1400 = E6C6 B  |
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New line in Arc utilities

Paul Hendy takes a look at an original concept in the field of information and text processing

> *Product: Premier*
> *Price: Basic module £72, wordprocessor and database applications £25, label printer and letter filing applications £20, language development pack £10 .*
> *Supplier: Circle Software, 33 Restrop View, Purton, Swindon, Wiltshire SN5 9DG.*
> *Tel: 0793 770021*
> *Requirements: BBC A3000 and Archimedes range*

WHEN Computer Concepts launched Wordwise Plus the computing world was stirred into excitement because of the novelty and versatility of a wordprocessor with a built-in programming language.

Many third-party software houses thus produced add-on routines to make the task of information processing much easier. With the launch of Premier, this concept of information and text processing has been taken several steps further, and it must rank as one of the most interesting products currently available.

Supplied on disc, the two manuals – user and reference – are well-written and easy to follow, with examples liberally strewn through the pages to guide you through the system.

However, the same cannot be said for the wordprocessor and database application manuals. Not very helpful, they need to be re-written if they are to benefit a newcomer.

Premier is loaded with the usual double-click on the scroll and quill icon. To be able to save and print you need a unique password – which is supplied – and the manual details ways of editing the !Run file so you don't have to enter the password every time.

Considering that this is an information processor, I would have thought it more helpful to provide a command script to do this automatically.

You'll be forgiven if you wonder what happens next, because nothing does until you issue an instruction. You can select Create and a window will open in which you can type, but clicking Menu over it will cause an error message about no menus being defined.

You can type text into this window, but any manipulation, marking, cutting, pasting and so on has to be done via the command window. If at this point you decide to read the manuals, you may well discard Premier and fail to appreciate what is actually happening.

Because Premier is primarily a program-

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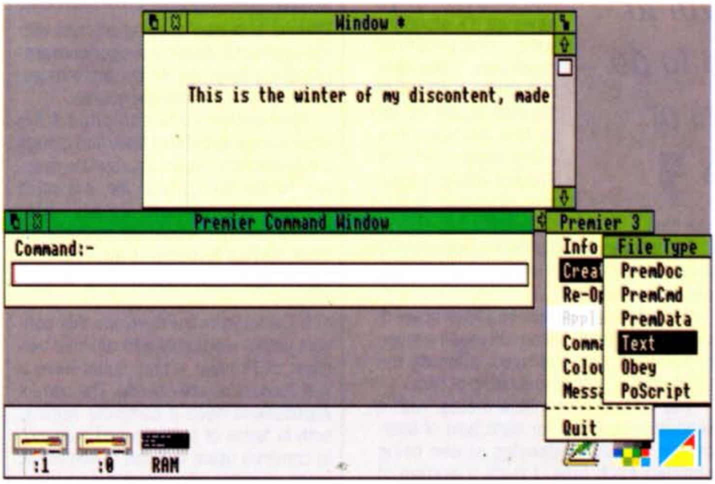
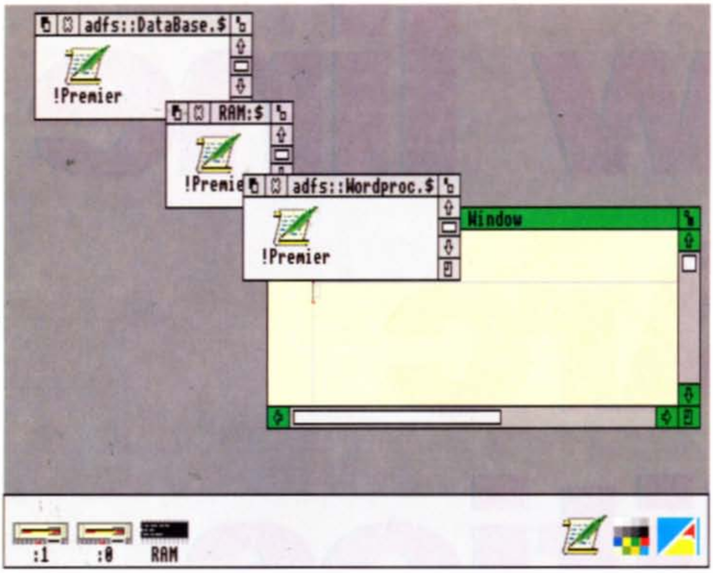


This is the winter of my discontent, made

Manipulate Premier as you will



More Premier applications are on the way

➤

ming language, it's like loading Basic and then expecting it to do something. You have got to tell it what to do via a series of commands which can be saved as scripts for later recall to save re-typing.

This extraordinary system is capable of producing user-defined menus, databases, word processors, spreadsheets – all customised to individual requirements.

Supplied with the review package was a wordprocessor and a database application. As finished products these don't do Premier justice, and I believe time should be spent on improving them.

The wordprocessor doesn't use the anti-alias fonts, but allows bold, underlining, italic and so on. Compared to other word-processors on the market this is barely adequate and reduces the product to the level of a text editor.

> *You have got to tell it what to do via a series of commands*

Much emphasis is made of dynamic commands – ones that are embedded and interpreted at the time of printing to ensure that they are always accurate.

Thus the current date and time can be inserted as a dynamic item so that the document prints the current date, not the one on which it was created.

Dynamic items may also include fields from datafiles, so that complex mailshots can be prepared, involving customer's names and addresses, calculations on invoices and VAT, reminders about dates and so on.

The process of entering dynamic commands is a bit laborious. A small window opens and you type in the command such as {centre} followed by the appropriate text. Much greater use of the function keys would have made it more user friendly.

There's no spelling checker, now *de rigueur* for any decent wordprocessor, and the limitation on font selection relegates this one to the also-ran league. However, it's very cheap and serves to show some of the potential of the main Premier system.

Similarly, the database application will not win prizes for innovation or sophistication, but it does serve to illustrate some of the basic principles and provides a framework which can be tailored to your requirements.

It operates on the usual card index concept and you can move forwards or backwards through the datafile, adding or editing records as required.

The data is stored in comma-delimited format (CSV) – good news as it's standard with most other databases. I was able to transfer a dBase III file from a 386 PC on to the Archimedes using PCDir and into Premier with only minimal alteration to the raw data.

Do note though, that the records are only separated by Ascii 10 while many CSV files also have Ascii 13.

Once the data window has been opened, clicking the centre button will cause a menu of options to be displayed, allowing the usual adding, editing and listing of data.

The editing was a little messy, with a window popping up for each item of information and the underlying screen being updated each time. I think a system of screens needs to be included with the demo data so that you can progress back and forth through the fields more easily.

Selecting the menu option dialogue box reveals a complex window enabling filters to be set, limiting the database to just those records required.

This starts to show some of the power of Premier, and while I feel that the window ought to be larger to avoid the need for horizontal scrolling of fields, the concept is easy to understand and execute.

As mentioned earlier, the manuals for these applications need to be improved. Nowhere could I find a hint how to display my database on screen, or to skip forward or backwards through the file, viewing each in turn.

I was able to work it out using the programming language, but an application written to illustrate the package's ease of use should be much easier to handle. Trying to print anything was extremely difficult, especially on the Laser Direct.

However, the main part of Premier is its language – and this is superb. The list of commands is impressive and it is very easy to design your own menu systems, application suites and custom-built programs.

The source code files for the word-processor and database application are provided, and it is worth studying them to learn how the various functions can be used. Routines can be tested one command at a time using the Command window and then combined to form systems. Creating pop-up menus couldn't be easier. The two lines:

```
Menu "Options" = "Add,Delete,Pri
nt,Modify,Exit"
Offer "Options"
```

would open up, at the current mouse pointer position, a normal menu, with each word calling its own macro. Even here though, the system needs some improving. If you enter "options" with a lower-case "o" as the second line, it will generate an error.

Summing up

Premier is a very exciting product with the potential to become a significant programming language for the Archimedes, useable by other software houses.

Applications are compiled from source code into object files, and though the system checks the appropriate directory for the source code file, this could merely be a null empty file. Consequently it would be possible for third parties to compile applications, supplying only the object files to customers.

If Circle Software develops this concept further – possibly with run-time versions of Premier – they could have a real success on their hands. The current applications need a complete rethink, both in terms of software and manuals, to convince users that this is something worth grappling with. I think it is.

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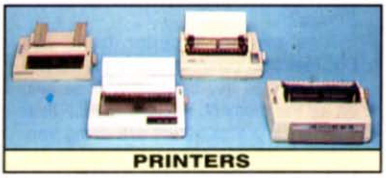
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Something something something

HacMan explores behind the games scene

Power pills

- News
- Ravenskull passwords
- More Repton Passwords
- Solution to Screen F of America

THIS month is a definite must for arcade/adventure fans, as it features two long-term favourites: One in its original form but just as tantalising as ever and one that has been revamped for the Archimedes to such a degree that it bears only a superficial resemblence to the BBC/Electron version.

But before we get underway, an interesting piece of news turned up a scant few hours before this column was due to disappear down the modem.

Many BBC Micro owners, particularly those who also own Repton 2, Citadel and some of the other early games released by Superior, will be familiar with Superior's **Speech!** program.

Although it was very popular at the time, I felt that it didn't achieve quite the success it should have. One possible reason was that although the words produced were perfectly intelligible, the whole implementation had a distinctly alien feel.

David Hoskins, author of the original, is presently working on a version for the Archimedes. Superior's Steve Hanson hasn't given any release dates, but I am sure that the proven talents of David Hoskins let loose on an Archimedes will produce something well worth waiting for. I wonder if its first word will be *Eureka*?

Also on the Superior front, the BBC/Electron compilations **Sams 15** and **16** mentioned last month are to be held off for the moment, simply because their immediate predecessors are doing very nicely thank you. After all, they do say that quality is better than quantity, and there can be few criticisms of the quality of the Sam compilations.

And so to the rest of the column...

The elusive Ravenskull

Whoops! OK, who spotted it? Yes, the last part of the saga of level 2 of **Ravenskull** that should have appeared in last month's column went into hiding just as the mag was making its way out of the door, and consequently missed out. However, better late than never:

We left our hero at the T junction quite a way directly north of the start position, having cleared all the treasure pieces from the south-west, south-east and north-east corners of the map.

Now take up your position and go west then north from the T junction and proceed to the west of this level. Pick up the magic potion that blocks your way, but don't use it yet.

Go south from here and clear the area of the five pieces of treasure, then return to where you found the bottle. Make your way to the north-west corner of the castle, where you will see a piece of treasure guarded by a line of five Ravenbees.

The magic potion will slow them – and you – to a speed at which it is easy, with care, to negotiate your passage and take the treasure. Making your way back past the bees, discard the potion. Going east then south through the maze you may well be getting short of energy, so pick up the fish which will give you a new lease of life – discard it straight away though.

The room of man-eating plants is next, and the scythe will enable you to gain access to the spade. Dropping the scythe, you'll notice a scroll in this area – ignore it. If you don't, you'll discover that it's a speed scroll which will make it almost impossible to pass the plants.

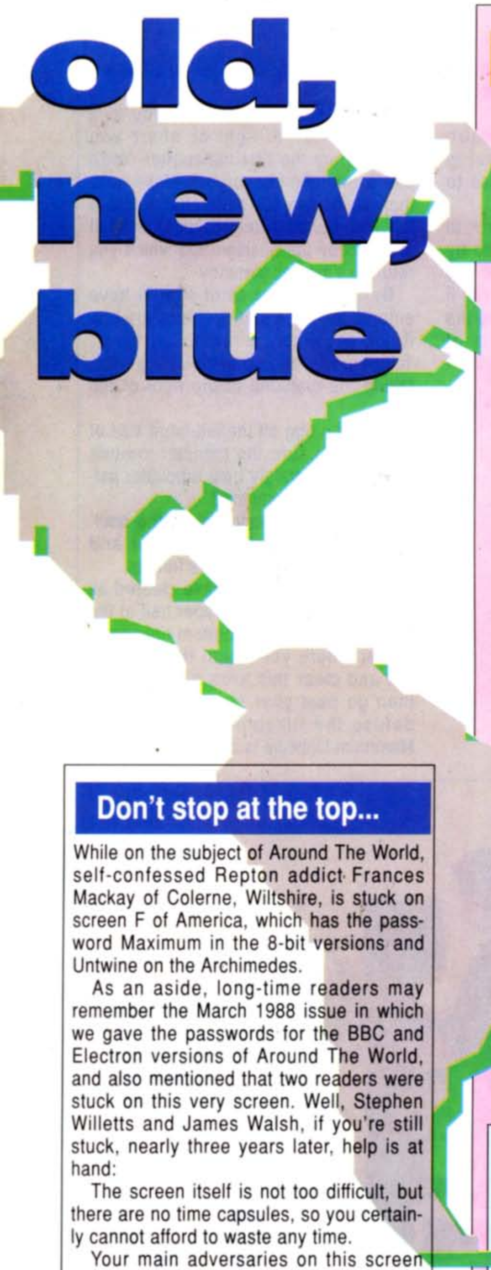
This is the time to use the second potion that you can see to the south – it'll restore your speed to normal – then retrace your steps to the T junction.

The eastern route along this east-west passage will lead into the central area where you found yourself at the end of part two by moving a cask and unlocking a door. Now use the spade to clear your way to the second piece of the crucifix. You have now completed the second level.

Thanks once again to Alan Busvine of Brislington, near Bristol, and Bill Hensman of Keighley, Yorkshire, for all their hard work.

Watch this space for the solution to level 3...

old, new, blue



Don't stop at the top...

While on the subject of Around The World, self-confessed Repton addict Frances Mackay of Colerne, Wiltshire, is stuck on screen F of America, which has the password Maximum in the 8-bit versions and Untwine on the Archimedes.

As an aside, long-time readers may remember the March 1988 issue in which we gave the passwords for the BBC and Electron versions of Around The World, and also mentioned that two readers were stuck on this very screen. Well, Stephen Willetts and James Walsh, if you're still stuck, nearly three years later, help is at hand:

The screen itself is not too difficult, but there are no time capsules, so you certainly cannot afford to waste any time.

Your main adversaries on this screen are two squares of "live" fungus, primarily the one in the bottom right-hand corner. You have a lot to do before they get out of control.

The opening sequence is the most time critical – make sure you are step perfect. I'll use the terminology of the original game to avoid confusion. Load the game, give the appropriate password and follow closely.

When the screen opens, a loose spirit will quickly enter the cage blocking your path to the key. It's vital to prevent this, because you need the spirit for a later cage.

Race to, and enter, the transporter

➤

Archi's own Repton 3

In last month's column I featured the passwords for Prelude, Toccata and Finale, the first three screens of Superior's **Archimedes Repton 3**. I am now continuing my delve into this ever-popular game with the full set of passwords to what was originally released for the 8-bit machines as Around The World In 40 Screens.

As that title implies, these screens number five sets of eight and document Repton's visits to five different parts of the world: America, the Arctic, the Orient, Africa and the bottom of the sea.

As anyone who was there when Around The World was first released will agree, this collection was quite significant in Repton's development, as was the debut of the character editor. Consequently, although the gameplay is identical to its predecessors, it *looked* dramatically different.

In the America screens you are a hamburger-munching Clint Eastwood look-a-like who must jail marauding bandits while avoiding the attentions of ferocious Indians.

In the Arctic you are an Eskimo fisherman. Beware of thin ice and polar bears. You next find yourself in the Orient dressed in a pair of pyjamas. Collect the Ming vases, but take care not to upset the locals – their karate is better than yours! An aqualung is your passport to the ocean bed, but beware of the bad tempered octopi.

Lastly, you play the part of a loin-clothed African looking for pineapples. Tread carefully to avoid the snakes in the grass.

The passwords for the full set of screens come courtesy of one of last month's contributors, Cleone Patterson of Amersham.

As seen in the Prelude, Toccata and Finale screens, all the passwords with the exception of screen A of each set are for obvious reasons quite different to those of the equivalent BBC Repton 3 screens.

Eagle-eyed BBC or Electron owners will notice that many of the edit codes are in the seventy thousands, with one in the ninety thousands, while the edit codes to their screens never exceeded the mid sixty thousands. This intrigued me, so I rang author John Wallace to find out a bit more.

He told me that, unlike the 8-bit versions which feature 16-bit edit code that can have values between zero and 65535, the Archimedes version features 32-bit edit codes.

Now in theory this means that the edit code of any Archimedes Repton 3 screen can have a value between zero and 4294967295 – 4096 Megacodes.

However, in actual fact the edit codes for the screens are calculated using the actual structure of the screens, unlike the Repton 3 for the 8 bit machines which just had stored values chosen at random by the screens designer.

This means that if any player of a cheating disposition edits a screen to make it easier, the edit code will change – clever stuff.

● *Next month I'll be featuring the passwords for Baby, School, Teens, Work and OAP, better known as The Life of Repton. Until then, happy hamburger hunting!*

America			**Arctic**		**Orient**	
A	AMERICA	72965	ARTIC	47534	ORIENT	60222
B	HERBAGE	77437	KINETIC	55458	ORGANIC	61969
C	KITCHEN	75585	GONDOLA	53231	ARMHOLE	61318
D	OUTCAST	47472	LOZENGE	28015	VISIBLE	65375
E	QUARTER	62367	ROTUNDA	50323	NEGLECT	44713
F	UNTWINE	68145	FRONTAL	46430	BIPLANE	47349
G	TREMBLE	76453	YOUNGER	49460	UMBRAGE	51043
H	STRANGE	46852	CLEANSE	38538	JANITOR	95541

Oceans		**Africa**	
A OCEANS	66541	AFRICA	59951
B DISDAIN	62344	QUICKLY	58162
C MUNDANE	59519	ZIGZAGS	61684
D ECLIPSE	58096	CLOSELY	58002
E WARNING	50775	PANOPLY	34727
F HUMDRUM	57382	BONFIRE	41114
G PANTHER	61684	HISTORY	61948
H ITERATE	57790	NUCLEUS	

➤

located above your start position. This will take you to the centre of the screen between two boulders: Push the right one a few spaces right to head off the spirit. It'll disappear into the cage further to your right, opening up a transporter.

Make sure that you do not touch the boulder to your left, or the wrong spirit will escape and obstruct the key.

In the transporter you'll find yourself in a small area bounded by a diamond below and a line of four boulders above you. The loose spirit on the other side of the diamond is there to complicate matters.

You must release both the spirit and the boulders without the latter stunning the former into inactivity, and without losing one of your lives.

A little nimble footwork should see you right.

Now make your way through this section of the screen, making sure that you collect the crown and every diamond, as they will become trapped by falling boulders when you take the key.

Before long you'll come to another trapped spirit. This time use the boulder above it to block off the area. This ensures that the spirit that is still at large will enter the cage that obstructs your access to this one.

Release this spirit, then run down and push across the boulder that is now obstructing the spirit's access to the cage that blocks the key.

Take a deep breath and run back to the transporter previously guarded by the newly-released spirit. At the top right in a small enclosed area you'll find boulders impeding your path to the transporter – your only means of escape. Traversing them shouldn't prove a problem for any Repton veteran.

> *Take a deep breath and run back to the transporter previously guarded by the newly-released spirit*

This transporter will take you to a point just to the right of where you arrived from the first transporter. You'll see a boulder above you: Make sure that you do not lose a life after you take the key, because that boulder will fall and occupy the position into which you return, killing you instantly.

By now the last spirit should have entered the cage that obstructs the key. If not, you'll hear a reassuring "ping". Take the key and go immediately right, taking the diamond to the right of the egg.

Push the egg off the left-hand side of this plateau, lure the monster towards you and run straight past a boulder balanced next to a diamond.

Taking the diamond will let the boulder fall, crushing the monster and blocking the advance of the fungus.

Make sure that you have cleared all the diamonds from the upper half of the screen. Return to the bottom right-hand corner where you found the egg. Go left and clear this area of diamonds, then go past your start position and defuse the timebomb. Hey presto, Maximum/Untwine is complete.

The economical and practical design of the City Desk Workstation removes the systems hardware from the desk surface providing optimum use of available space. Its many design features are suited to home or office use.

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Make your wife's day... Eric Ellis offers a program to end those shopping day blues

Shopping around

Safebury's
the better
place to
shop
made out
ycled paper

SHOPPING comes to us all in the end, and anything that makes it easier is definitely to be welcome. One of the major headaches is forgetting things. Shopping lists help, but how many times have you forgotten to add a necessary item?

Well this program will not only compile your shopping list – including approximate prices – but it will also help to remind you what's available at each shop.

You make your selections from a master list that can be edited to suit the shelf layout for a particular shop, and with just a little planning your shopping list will appear in the same order as found on your normal route through the supermarket.

When you CHAIN"Shops" you are asked to enter the date, and the suggested format is shown on screen ready to be overtyped with the correct date.

Next you are invited to enter a list name which should be that of your master list or the name that you wish to use if you have not yet made a list. *CAT or its abbreviation *. may be entered at the prompt to catalogue the disc.

The list name is checked and if it does not exist you are asked if you want to create a new list of this name. Answering Y creates an empty file ready for use, while N takes you back to enter another list name. ADFS users may use 10 character names by changing the variable *file%* from 7 to 10.

You can use the cursor keys to move around the master list entries, and trying to move off the bottom results in a request for a new item.

A valid entry is accepted on pressing Return and you will be asked to enter a price. If you do not yet have a price press Return and 0.00 will be taken as the entry. The date is entered automatically.

If you want to edit a record, position the cursor under the description or price requiring editing and press the spacebar. The selected field is highlighted and the program goes into Word Edit mode. The cursor keys now allow you to move along the string and you can overtype any or all of the characters. The Copy key inserts a space at the cursor and moves the text to the right, while Delete removes the character above the cursor and closes up the text. The normal delete function occurs if the cursor is at the end of the string.

When you press Return the string on the screen is accepted as shown, so you do not need to re-enter the whole string. However, individual characters may be changed inserted or deleted at will. Pressing Return once more brings you back to the main menu.

When you select Compile Shopping List you are shown a screen layout as for the Enter/Edit, but the cursor is restricted to the left side of the screen.

Pressing the spacebar will select or deselect the item at the cursor for your list. Selections are highlighted in red and returned to green if deselected. Return ends the process and goes back to the menu.

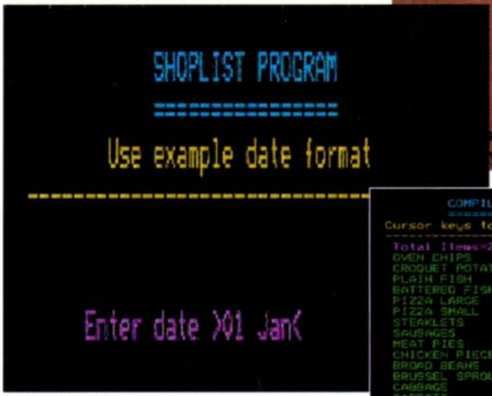
Items added in this way after the shopping list has been compiled will then be included automatically on the shopping list, making it unnecessary to re-enter Compile before printing on an Epson-compatible printer.

The print options first test that the printer is on line and then set it up as required. Compressed print in four columns is used for the master list because of the large number of items possible.

Data can be saved at any time from the menu if you have made any changes or added new items. You are also invited to save when leaving the program if you have not already done so. Only the master list is saved, as each shopping list is expected to be different.

If you have more than one shop file, the Change Shop File option gives an easy way of changing between them.

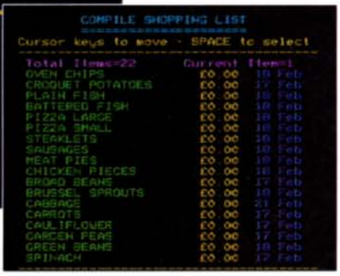
● *So now your wife can trog off to Tesco secure in the knowledge that she won't miss anything. Or perhaps you will be lumbered with this high tech job!*



```
SHOPLIST PROGRAM
================
Use example date format
----------------------------------------

Enter date >01 Jan<
```

Just popping out to Harrod's, dear



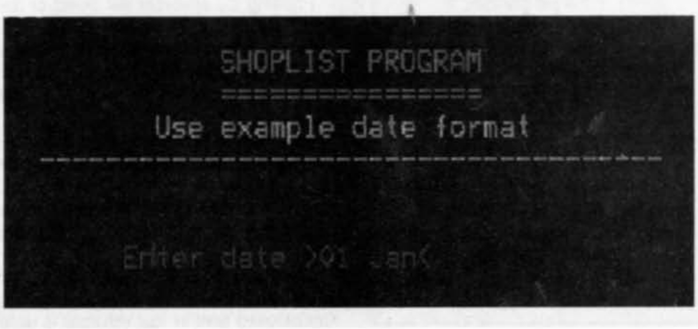
```
         COMPILE SHOPPING LIST
         =====================
Cursor keys to move - SPACE to select
----------------------------------------
 Total Items=22         Current Item=1
 OVEN CHIPS               £0.00  18 Feb
 CROQUET POTATOES         £0.00  17 Feb
 PLAIN FISH               £0.00  18 Feb
 BATTERED FISH            £0.00  18 Feb
 PIZZA LARGE              £0.00  18 Feb
 PIZZA SMALL              £0.00  18 Feb
 STEAKLETS                £0.00  18 Feb
 SAUSAGES                 £0.00  18 Feb
 MEAT PIES                £0.00  18 Feb
 CHICKEN PIECES           £0.00  18 Feb
 BROAD BEANS              £0.00  17 Feb
 BRUSSEL SPROUTS          £0.00  18 Feb
 CABBAGE                  £0.00  21 Feb
 CARROTS                  £0.00  17 Feb
 CAULIFLOWER              £0.00  17 Feb
 GARDEN PEAS              £0.00  17 Feb
 GREEN BEANS              £0.00  18 Feb
 SPINACH                  £0.00  17 Feb
----------------------------------------
```

MAIN VARIABLES

A%	Preselects menu option to be highlighted.
A$	Screen layout pad character and local variable.
A$(J%)	Printer pad characters.
blank$(J%)	Used to create empty file.
changed	Flag to determine if data has been changed.
I%,J%	Local variables used in loops.
list%(I%)	Items selected for shopping list.
list	Flag to determine if shopping list exists
lines	Number of lines per screen page.
M$(I%,J%)	Program data in three fields.
maxrecs	Maximum number of items allowed in master list.
N%	Current total of items in master list.

```
   10 REM Shoplist Program
   20 REM By Eric Ellis
   30 REM (c) The Micro User
   40 MODE 7:maxrecs=288:N%=0:file%=7
   50 chng=FALSE:quit=FALSE:cat=FALSE
   60 list=FALSE:fname$="":ENVELOPE 1,1,
0,0,0,0,0,0,127,-2,-2,-1,126,90
   70 DIM M$(maxrecs+1,3),list%(maxrecs)
,blank$(3),A$(3)
   80 blank$(1)=STRING$(20," ")
   90 blank$(2)="0.00"
  100 blank$(3)=STRING$(6," "):A$(1)=" "
  110 A$(2)=" #":A$(3)="  "
  120 ON ERROR PROCerror:END
  130 *FX4,2
  140 *FX225,128
  150 *FX226,144
  160 *FX12,3
  170 PROCvalid
  180 PROCheading("SHOPLIST PROGRAM","Us
e example date format")
  190 PRINTTAB(5,2)CHR$133"Enter date >"
TAB(24,2)"<"TAB(18,2);
  200 date$=FNedit("01 Jan",cap$+low$+nu
m$+" ")
  210 REM Master series replace line wit
h "date$=MID$(TIME$,5,6)"
  220 PROCfile:ON ERROR PROCerror
  230 REPEAT REPEAT edit%=FALSE
  240 PROCmenu(A%):UNTIL quit
  250 IF chng A%=5:PROCmessage(""):PRINT
';:IF FNyn("Do you want to save changed
data?  <Y/N>")="Y" quit=FALSE
  260 UNTIL quit:CLS:PROCend
  270 END
  280 :
  290 DEF PROCload(f$):LOCAL I%,J%,ch%
  300 CLS:PRINTTAB(11,5)CHR$129CHR$136"L
OADING DATA"
  310 ch%=OPENUP(f$):I%=0
  320 REPEAT I%=I%+1:FOR J%=1 TO 3
  330 INPUT#ch%,M$(I%,J%):NEXT
  340 UNTIL M$(I%,1)=STRING$(20," ")
  350 CLOSE#ch%:N%=I%-1:IF N%=0 A%=1 ELS
E A%=2
  360 FOR I%=1 TO maxrecs:list%(I%)=0
  370 NEXT:list=FALSE:ENDPROC
  380 :
  390 DEF PROCquit:quit=TRUE:ENDPROC
  400 :
  410 DEF PROCend
  420 VDU23,1,1;0;0;0;:VDU26
  430 *FX4,0
  440 *FX225,1
  450 *FX226,128
  460 *FX12,8
  470 ENDPROC
  480 :
  490 DEF PROCfile:fname$=FNgetfilename
  500 PROCload(fname$):ENDPROC
  510 :
  520 DEF FNgetfilename:LOCAL ch%,f$
  530 REPEAT PROCheading("SELECT SHOP","
*CAT for catalogue")
  540 REPEAT PRINTTAB(5,2)CHR$134"Enter
Listname >"TAB(22+file%,2)"<"TAB(22,2);
  550 f$=FNedit(STRING$(file%," "),cap$+
low$+num$+"_/*.")
  560 UNTIL f$<>STRING$(file%," ") AND f
$<>"*"+STRING$(file%-1," ")
  570 IF LEFT$(f$,2)="*." OR LEFT$(f$,4)
="*CAT" cat=TRUE:PRINT':*CAT
  580 IF cat PRINT'TAB(5)CHR$130"Press S
PACE to continue":cat=FALSE:REPEATUNTILG
ET=32:UNTIL FALSE
  590 ch%=OPENUP(f$):CLOSE# ch%
  600 IF ch%=0 VDU7:PRINTTAB(10,4)CHR$13
1"Not found":PRINT:*CAT
  610 IF ch%=0 PRINT'CHR$134;:IF FNyn("D
o you want to start a new list? <Y/N>")=
"Y" PROCnewfile
  620 UNTIL ch%>0:A%=1:=f$
  630 :
  640 DEF PROCvalid
  650 cap$="ABCDEFGHIJKLMNOPQRSTUVWXYZ"
  660 low$="abcdefghijklmnopqrstuvwxyz"
  670 pun$=",.;:*+/?-=""()&'!^\' "
  680 num$="1234567890":ENDPROC
  690 :
  700 DEF FNedit(a$,valid$)
  710 LOCALlen,x,y,pos,g:x=POS:y=VPOS
  720 VDU23,1,1;0;0;0;:len=LENa$
  730 REPEAT IF pos=len pos=pos-1
  740 PRINTTAB(x,y)a$TAB(x+pos,y);:*FX21
  750 g=GET:IF g=13 UNTIL TRUE:=a$
  760 IF g=140 AND pos=0 OR g=141 AND po
s+1=len OR g=127 AND a$=STRING$(len," ")
 VDU7:UNTIL FALSE
  770 IF g=140 pos=pos-1:UNTIL FALSE ELS
E IF g=141 pos=pos+1:UNTIL FALSE
  780 IF g=127 AND RIGHT$(a$,len-pos)=ST
RING$(len-pos," ") pos=pos-1:a$=LEFT$(a$
,pos)+STRING$((len-pos," "):UNTIL FALSE E
LSE IF g=127 a$=LEFT$(a$,pos)+RIGHT$(a$,
len-pos-1)+" ":UNTIL FALSE
  790 IF g=139 a$=LEFT$(a$,pos)+" "+MID$
(a$,pos+1,len-pos-1):UNTIL FALSE
  800 IF INSTR(valid$,CHR$g)=0 VDU7:UNTI
L FALSE ELSE a$=LEFT$(a$,pos)+CHR$g+MID$
(a$,pos+2,len-pos-1):pos=pos+1:IF pos=le
n SOUND 3,1,136,16
  810 UNTIL FALSE
  820 :
  830 DEF PROCerror
  840 CLOSE#0:VDU6:A%=7
  850 IF ERR=17 ENDPROC
  860 PROCmessage(CHR$11):REPORT:PRINT"
at line ";ERL:PRINT;:IF FNyn("Continue?
<Y/N>")="Y" ENDPROC
  870 PROCquit:PROCend:CLS:END
  880 :
  890 DEF FNyn(m$):LOCAL A$:PRINTm$" ";
  900 REPEAT A$=CHR$(GETAND&5F)
  910 UNTIL INSTR("YN",A$)>0:=A$
  920 :
  930 DEF PROCmenu(choice)
  940 LOCAL I%
  950 VDU23,1,0;0;0;0;
  960 PROCheading("MAIN MENU","CURSOR KE
YS to select then "+CHR$134+"<RETURN>")
  970 RESTORE 3060
  980 I%=FNmenu(choice)
  990 ON I% GOTO 1000,1010,1020,1030,104
0,1050,1060
 1000 PROCedit:ENDPROC
 1010 PROCcompile:ENDPROC
 1020 PROCprintlist:ENDPROC
 1030 PROCprintmaster:ENDPROC
 1040 PROCsave:ENDPROC
 1050 PROCfile:ENDPROC
 1060 PROCquit:ENDPROC
 1070 :
 1080 DEF FNmenu(I)
 1090 LOCAL J,V,H,A$
 1100 V=1:H=9:READ options
 1110 FOR J=1 TO options:READ A$:PRINTTA
B(H+1,V+(J*2))A$:NEXT
 1120 REPEAT
 1130 PRINTTAB(H,V+(I*2))CHR$129:*FX21,0
 1140 g=GET
 1150 IF g=13 UNTIL TRUE:VDU26:=I
 1160 IF g=142 OR g=143 PRINTTAB(H,V+(I*
2))CHR$135;
 1170 IF g=142 AND I<options I=I+1 ELSE
IF g=142 AND I=options I=1
 1180 IF g=143 AND I>1 I=I-1 ELSE IF g=1
43 AND I=1 I=options
 1190 UNTIL FALSE
 1200 :
 1210 DEF PROCheading(A$,B$)
 1220 LOCAL H,H1:VDU26:CLS
 1230 H=19-(LEN(A$)+1)DIV2
 1240 H1=19-(LEN(B$)+1)DIV2
 1250 PRINTTAB(H,0)CHR$134A$TAB(H,1)CHR$
134 STRING$(LEN(A$),"=")
 1260 PRINTTAB(H1,2)CHR$131B$TAB(0,3)CHR
$131 STRING$(38,"_");
 1270 VDU28,0,23,39,4:ENDPROC
 1280 :
 1290 DEF PROCscreen(start,finish)
 1300 LOCAL I%,J%,end,A$
 1310 IF finish>N% end=N% ELSE end=finis
h
 1320 CLS:PRINT
 1330 FOR I%=start TO end:FOR J%=1 TO 3
 1340 IF (J%=1 AND list%(I%) AND NOT edi
t%) A$=CHR$129 ELSE IF J%=2 A$=" `" ELSE
 A$=" "
 1350 PRINTCHR$(129+J%)A$M$(I%,J%);:NEXT
 1360 IF I%<finish PRINT
 1370 NEXT:ENDPROC
 1380 :
 1390 DEF PROCedit
 1400 LOCAL H%,htab,vtab,g,page,lines
 1410 IF fname$="" A%=6:ENDPROC
 1420 htab=2:lines=18:page=0:start=1:fin
ish=lines:edit%=TRUE
 1430 PROCheading("ENTER/EDIT ITEMS","Cu
rsor keys to move - SPACE to change")
 1440 VDU26:PRINTTAB(0,23)CHR$131STRING$
(38,"_")TAB(0,24)CHR$131"COPY=Insert
DELETE=Delete at cursor";:VDU28,0,22,39,
4
 1450 VDU23,1,1;0;0;0;:PROCscreen(start,
finish)
 1460 IF N%=0 PROCnewline
 1470 I%=1:H%=1
 1480 REPEAT
 1490 IF N%=maxrecs full=TRUE ELSE full=
FALSE
 1500 IF I%<=lines firstpage=TRUE ELSE f
irstpage=FALSE
 1510 IF N%<=(page+1)*lines lastpage=TRU
E ELSE lastpage=FALSE
 1520 vtab=I%-(page*lines)
 1530 PRINTTAB(1,0)CHR$133"Total Items="
;N%;TAB(22,0)"Current Item=";I%;"  ";
 1540 temp$="":PRINTTAB(htab,vtab);:*FX2
1,0
 1550 g=GET
```

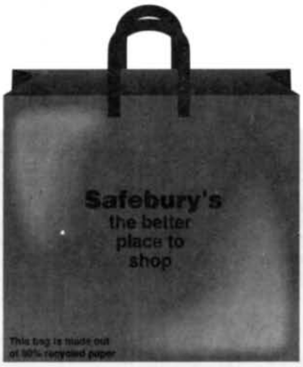
SUBSCRIBE NOW!
If you prefer to save the wear and tear on your fingers you'll find this listing – together with all the others from this issue – on this month's disc, sent free if you subscribe to *The Micro User.*



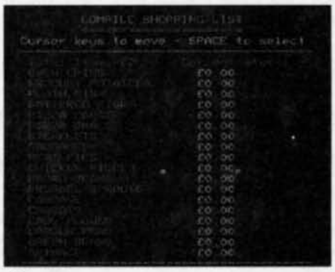
```
SHOPLIST PROGRAM
================
Use example date format
------------------------------------------------

Enter date >01 Jan<
```

```
 1560 IF g=32 AND N%<1 VDU7:UNTIL FALSE
ELSE IF g=32 AND H%=1 PRINT CHR$8CHR$134
;:temp$=FNedit(M$(I%,H%),cap$+low$+num$+
pun$) ELSE IF g=32 AND H%=2 PRINT CHR$8C
HR$134"`";:temp$=FNedit(M$(I%,H%),num$+"
.")
 1570 IF g=32 AND temp$<>M$(I%,H%) AND t
emp$<>STRING$(20," ") M$(I%,H%)=temp$:M$
(I%,3)=date$:chng=TRUE:PROCscreen(start,
finish):UNTIL FALSE ELSE IF g=32 PROCscr
een(start,finish):UNTIL FALSE
 1580 IF(g=143 AND I%=1) OR (g=159 AND f
irstpage=TRUE) VDU7:UNTIL FALSE
 1590 IF(g=143 AND I%=start) OR g=159 PR
OCdec:IF g=143 I%=I%-1:PROCscreen(start,
finish):UNTIL FALSE ELSE IF g=159 I%=I%-
lines:PROCscreen(start,finish):UNTIL FAL
SE
 1600 IF g=143 I%=I%-1
 1610 IF(g=158 AND lastpage) OR (g=142 A
ND I%=maxrecs) VDU7:UNTIL FALSE
 1620 IF g=158 AND I%>N%-lines I%=N%:PRO
Cinc:PROCscreen(start,finish):UNTIL FALS
E
 1630 IF(g=142 AND I%=N% AND I%=finish A
ND NOT full)OR g=158 PROCinc:IF g=142 I%
=I%+1:PROCnewline:PROCscreen(start,finis
h):UNTIL FALSE ELSE IF g=158 I%=I%+lines
:PROCscreen(start,finish):UNTIL FALSE
 1640 IF g=142 AND I%=N% AND NOT full I%
=I%+1:PROCnewline:UNTIL FALSE
 1650 IF g=142 AND I%=finish AND NOT ful
l I%=I%+1:PROCinc:PROCscreen(start,finis
h):UNTIL FALSE
 1660 IF g=142 I%=I%+1
 1670 IF g=140 AND H%=1 VDU7:UNTIL FALSE
 1680 IF g=140 H%=1:htab=2
 1690 IF g=141 AND H%=2 VDU7:UNTIL FALSE
 1700 IF g=141 H%=2:htab=24
 1710 IF (g=139 AND N%=maxrecs) OR (g=13
9 AND I%<1) VDU7:UNTIL FALSE
 1720 IF g=139 PROCinsert
 1730 IF g=127 AND I%=start AND I%>lines
 AND I%=N% PROCdec ELSE IF g=127 AND I%<
1 VDU7:UNTIL FALSE
 1740 IF g=127 PROCdelete:UNTIL FALSE
 1750 UNTIL g=13:IF chng A%=5 ELSE A%=7
 1760 ENDPROC
 1770 :
 1780 DEF PROCinc:start=start+lines
 1790 page=page+1:finish=finish+lines
 1800 ENDPROC
 1810 :
 1820 DEF PROCdec:start=start-lines
 1830 page=page-1:finish=finish-lines
 1840 ENDPROC
 1850 :
 1860 DEF PROCinsert
 1870 LOCAL I,J:PROCmessage("MAKING ROOM
 - PLEASE WAIT")
 1880 FOR I=N%+1 TO I%+1 STEP-1
 1890 FOR J=1 TO 3:M$(I,J)=M$(I-1,J):NEX
T
 1900 IF list list%(I)=list%(I-1)
 1910 NEXT:IF list list%(I%)=TRUE
 1920 PROCnewline:ENDPROC
 1930 :
 1940 DEF PROCnewline:PROCnewrecord
 1950 N%=N%+1:PROCscreen(start,finish)
 1960 ENDPROC
 1970 :
 1980 DEF PROCnewrecord
 1990 PRINTTAB(0,5)SPC40CHR$133;STRING$(
38,"=");SPC161CHR$133;STRING$(38,"=")SPC
41;TAB(4,8)CHR$134"Enter Item  ";:REPEAT
:M$(I%,1)=FNedit(blank$(1),cap$+low$+pun
$+num$):UNTIL M$(I%,1)<>STRING$(20," ")
 2000 PRINTTAB(4,9)CHR$134"Enter Price
";:M$(I%,2)=FNedit(blank$(2),num$+".")
 2010 M$(I%,3)=date$:chng=TRUE:IF list l
```



```
ist%(I%)=TRUE
 2020 ENDPROC
 2030 :
 2040 DEF PROCdelete:LOCAL I,J
 2050 IF I%=N% GOTO 2100 ELSE PROCmessag
e("DELETING RECORD")
 2060 FOR I=I% TO N%-1
 2070 FOR J=1 TO 3:M$(I,J)=M$(I+1,J):NEX
T
 2080 IF list list%(I)=list%(I+1)
 2090 NEXT:list%(N%)=FALSE
 2100 FOR J=1 TO 3:M$(N%,J)=blank$(J):NE
XT
 2110 N%=N%-1
 2120 IF I%>N% I%=N%
 2130 chng=TRUE:PROCscreen(start,finish)
 2140 ENDPROC
 2150 :
 2160 DEFPROCprintercheck
 2170 IF FNprintertest ENDPROC
 2180 REPEAT:*FX15
 2190 PRINTTAB(5,10)CHR$131CHR$157CHR$12
9"PRINTER NOT ON LINE  "CHR$156
 2200 VDU7:X=INKEY(300)
 2210 UNTIL FNprintertest:CLS:ENDPROC
 2220 :
 2230 DEF FNprintertest
 2240 VDU2,1,32,1,127,3:X=INKEY(10)
 2250 =(ADVAL(-4)=63)
 2260 :
 2270 DEF PROCsave:LOCAL I%,J%
 2280 IF N%=0 A%=6:ENDPROC
 2290 IF NOT chng PROCmessage("No need t
o save. Data not changed."):PRINT'CHR$13
1;:IF FNyn("since last save. Abort save?
 <Y/N>")="Y" A%=7:ENDPROC
 2300 CLS:PRINTTAB(12,13)CHR$129CHR$136"
SAVING DATA"
 2310 ch%=OPENUP(fname$)
 2320 FOR I%=1 TO N%
 2330 FOR J%=1 TO 3:PRINT#ch%,M$(I%,J%):
NEXT
 2340 NEXT
 2350 FOR J%=1 TO 3:PRINT#ch%,blank$(J%)
:NEXT
 2360 CLOSE#ch%:chng=FALSE:A%=7
 2370 ENDPROC
 2380 :
 2390 DEF PROCnewfile:LOCAL I%,J%
 2400 CLS:PRINTTAB(4,10)CHR$129CHR$136"P
LEASE WAIT - CREATING "f$
 2410 ch%=OPENOUT(f$)
```



```
COMPILE SHOPPING LIST
Cursor keys to move - SPACE to select
```

```
 2420 FOR I%=1 TO maxrecs+1
 2430 FOR J%=1 TO 3:PRINT#ch%,blank$(J%)
:NEXT
 2440 NEXT:CLOSE#ch%:ENDPROC
 2450 :
 2460 DEF PROCprintmaster
 2470 LOCAL I%,J%,column%
 2480 IF N%=0 A%=6:ENDPROC
 2490 column%=4
 2500 PROCheading("PRINT MASTER LIST","P
rints full list of available items")
 2510 VDU28,0,24,39,4
 2520 PRINTTAB(3,8)CHR$131;:IF FNyn("Do
you want to print list?  <Y/N>")="N" A%=
4:ENDPROC
 2530 PROCprintercheck
 2540 PRINTTAB(8,10)CHR$129CHR$136"PRINT
ING MASTER LIST"
 2550 VDU2,21,1,27,1,82,1,3,1,27,1,78,1,
4,1,15
 2560 PRINT" Master List: "fname$;SPC10;
N%" items":PRINT
 2570 I%=0:REPEAT I%=I%+1
 2580 IF I%>N% UNTIL TRUE:VDU6,1,12,1,27
,1,64,3:A%=7:ENDPROC
 2590 FORJ%=1TO2:PRINTA$(J%)M$(I%,J%);:N
EXT
 2600 IF I% MOD column%=0 OR I%=N% PRINT
 ELSE PRINT SPC6;
 2610 UNTIL FALSE
 2620 :
 2630 DEF PROCcompile
 2640 LOCAL htab,vtab,page,lines,g
 2650 IF N%=0 A%=6:ENDPROC
 2660 htab=2:lines=18:page=0:start=1:fin
ish=lines
 2670 PROCheading("COMPILE SHOPPING LIST
","Cursor keys to move - SPACE to select
")
 2680 VDU26:PRINTTAB(0,23)CHR$131STRING$
(38,"_");TAB(7,24)CHR$131"RETURN to end
selection";:VDU28,0,22,39,4
 2690 VDU23,1,1;0;0;0;:PROCscreen(start,
finish):I%=1
 2700 REPEAT
 2710 vtab=I%-(page*lines)
 2720 PRINTTAB(1,0)CHR$133"Total Items="
;N%;TAB(22,0)"Current Item=";I%;"  ";
 2730 PRINTTAB(htab,vtab);:*FX21,0
 2740 g=GET
 2750 IF g=32 IF NOT list%(I%) PRINT CHR
$8CHR$129;:list%(I%)=TRUE ELSE IF g=32 I
F list%(I%) VDU8,130:list%(I%)=FALSE
 2760 IF g=143 IF I%=1 VDU7:UNTIL FALSE
 2770 IF g=143 IF page>0 IF I%=start I%=
I%-1:PROCdec:PROCscreen(start,finish):UN
TIL FALSE
 2780 IF g=143 I%=I%-1
 2790 IF g=142 IF I%=N% VDU7:UNTIL FALSE
 2800 IF g=142 IF I%=finish I%=I%+1:PROC
inc:PROCscreen(start,finish):UNTIL FALSE
 2810 IF g=142 I%=I%+1
 2820 UNTIL g=13:A%=3:list=FALSE
 2830 FOR I=1 TO maxrecs
 2840 IF list%(I)=TRUE list=TRUE
 2850 NEXT:ENDPROC
 2860 :
 2870 DEF PROCprintlist:LOCAL I%,J%
 2880 IF N%=0 A%=6:ENDPROC
 2890 IF NOT list A%=2:ENDPROC
 2900 PROCheading("PRINT SHOPPING LIST",
"Print out selected items only")
 2910 VDU28,0,24,39,4
 2920 PRINTTAB(3,8)CHR$131;:IF FNyn("Do
you want to print list?  <Y/N>")="N" A%=
3:ENDPROC
 2930 PROCprintercheck
 2940 PRINTTAB(8,10)CHR$129CHR$136"PRINT
```

➤

```
ING SHOPPING LIST"
 2950 VDU2,21,1,27,1,82,1,3,1,27,1,78,1,
4
 2960 PRINT" Shopping List: "fname$;SPC4
;date$:PRINT
 2970 FOR I%=1 TO N%
 2980 IF list%(I%) FOR J%=1 TO 3:PRINT A
$(J%);M$(I%,J%);:NEXT:PRINT
 2990 NEXT
 3000 VDU6,1,12,1,27,1,64,3:A%=5:ENDPROC
 3010 :
 3020 DEF PROCmessage(a$)
 3030 PRINTTAB(0,5)SPC40CHR$133STRING$(3
8,"=")SPC161CHR$133STRING$(38,"=")SPC40;
 3040 PRINTTAB(0,8)CHR$131a$;:ENDPROC
 3050 :
 3060 DATA 7,Enter/Edit Items,Compile Sh
opping List,Print Shopping List,Print Ma
ster List,Save Data,Change Shop File,Qui
t Program
```

Get it right!

```
  10 =    0 0
  20 =    0 0
  30 =    0 0
  40 = 9CAF F
  50 = 71F0 F
  60 = B967 9
  70 =  825 7
  80 = 5E91 3
  90 = DAAA 5
 100 = 7A3D 0
 110 = C8C6 8
 120 = 917E D
 130 = D3E0 D
 140 = 917D 2
 150 = 1485 C
 160 = D975 1
 170 = 9603 1
 180 = 54A9 6
 190 = F1C8 F
 200 = 65BD 4
 210 =    0 4
 220 = 4977 3
 230 = ABA0 6
 240 = 5FFE 1
 250 = 532D 1
 260 = 8B06 B
 270 = FD2E C
 280 = 9719 6
 290 = 22C7 C
 300 = AF1B C
 310 =  858 A
 320 = B8EA D
 330 = 7054 3
 340 =  7CF 0
 350 = E7CD 5
 360 = 9D87 3
 370 = D155 F
 380 = 9719 D
 390 = 7A04 0
 400 = 9719 4
 410 = E4FA 1
 420 =    3 6
 430 = F3A2 8
 440 = 294B C
 450 = 7FAF 3
 460 = 681E 4
 470 = ED0F 2
 480 = 9719 0
 490 = CA02 D
 500 = F925 2
 510 = 9719 C
 520 = B77C E
 530 = E789 7
 540 = 61C8 B
 550 = 9901 F
 560 = 2176 8
 570 = 9733 2
 580 = 42A0 1
 590 = 828E 0
 600 = A16C 0
 610 = B50F E
 620 = 1FD2 9
 630 = 9719 0
 640 = 9874 C
 650 = 3A4A B
 660 = 11C1 0
 670 = 3E66 4
 680 = 331F 5
 690 = 9719 C
 700 = D656 6
 710 = C14A 5
 720 = EF7E 4
 730 = 36B5 6
 740 = BE88 B
 750 = 8D12 C
 760 = F036 E
 770 = 39AE F
 780 = 144E A
 790 = 2D3D C
 800 = F27D 3
 810 = 226C D
 820 = 9719 C
 830 = 72B4 4
 840 = 73A1 C
 850 =  E65 8
 860 = 98FA C
 870 =  3A3 B
 880 = 9719 E
 890 = 1B47 C
 900 = E46F F
 910 = 4665 C
 920 = 9719 F
 930 = 87DC 0
 940 = A914 C
 950 = 1E64 C
 960 = D9B4 A
 970 = CF6E 7
 980 = 50C2 B
 990 = E3CB 6
1000 = 6A84 8
1010 = A822 7
1020 = C1FE 7
1030 = 7827 5
1040 = 65AC A
1050 = 4D08 0
1060 = D8AA 3
1070 = 9719 B
1080 = E4CE 6
1090 = FB26 0
1100 = 13FA 0
1110 = 9BEC F
1120 = BFBA 5
1130 = 36AC F
1140 = 887D 9
1150 =  880 0
1160 =  8AF 7
1170 = 7481 B
1180 = 1A44 0
1190 = 226C 5
1200 = 9719 0
1210 =  945 8
1220 = 5C95 C
1230 = F7CD 2
1240 = 903B 2
1250 = DBFA 2
1260 = 7909 9
1270 = DBAE 9
1280 = 9719 6
1290 = 228F 8
1300 = A6AD 6
1310 = 5625 B
1320 = 8005 2
1330 = 94E1 E
1340 = FA47 9
1350 = AED7 7
1360 =  BC8 7
1370 = E531 D
1380 = 9719 4
1390 = C824 A
1400 = 2D6C 5
1410 = 6116 6
1420 = DE5F 3
1430 = 628E 2
1440 = F70B 0
1450 = 66A5 0
1460 = 44D9 A
1470 = EEEA 1
1480 = BFBA B
1490 = ACBE 6
1500 = 6A44 7
1510 = E2C1 B
1520 =   D6 4
1530 = C06B 3
1540 = 3BCB C
1550 = 887D 9
1560 = 3FFB F
1570 = CA8B 4
1580 = B398 1
1590 = 78C8 1
1600 = 7938 5
1610 = E7C7 9
1620 = B57D E
1630 =  A65 A
1640 = EBE2 A
1650 = F456 D
1660 = 3BBD 6
1670 = 4BB2 9
1680 = 7D35 6
1690 = 2D3B F
1700 = BAC8 2
1710 = A761 9
1720 = F61D E
1730 = 14B5 A
1740 = 6B84 E
1750 = A332 E
1760 = ED0F 0
1770 = 9719 9
1780 = 18AA 5
1790 = F05B 5
1800 = ED0F 8
1810 = 9719 2
1820 =  B1C 3
1830 =  14B 1
1840 = ED0F 8
1850 = 9719 8
1860 = E121 A
1870 = 114D F
1880 = 61FF 7
1890 = 94DB F
1900 = BE68 3
1910 = 8EBB 5
1920 = 5F57 2
1930 = 9719 D
1940 = A5F7 B
1950 = A88C B
1960 = ED0F 7
1970 = 9719 A
1980 =  A96 F
1990 = 746C 0
2000 = 4C12 B
2010 = 7D44 0
2020 = ED0F 2
2030 = 9719 8
2040 = A4AD 6
2050 = 1F53 B
2060 = B1E8 7
2070 = 35FD F
2080 =  CC8 D
2090 = 1378 B
2100 = F65C B
2110 = 43C1 9
2120 = 81DD B
2130 = ADE6 8
2140 = ED0F 9
2150 = 9719 4
2160 = 9019 E
2170 = 5C81 C
2180 = 5F93 B
2190 = F415 D
2200 = 84EA 1
2210 = 4F91 F
2220 = 9719 B
2230 = 3B50 6
2240 = 95D3 D
2250 = FED9 F
2260 = 9719 7
2270 = 2B5C 7
2280 = 6911 F
2290 = CE94 7
2300 =  272 F
2310 = 24E1 6
2320 = F1EE 7
2330 = D053 D
2340 = 2C83 0
2350 = E405 0
2360 = 4F06 7
2370 = ED0F 5
2380 = 9719 C
2390 =  E62 6
2400 = 7E99 9
2410 = 317E E
2420 = B3C4 2
2430 = E405 5
2440 = 1E36 8
2450 = 9719 D
2460 = D1D9 D
2470 = 7DAF E
2480 = 6911 4
2490 = CDF1 6
2500 = B7AB 5
2510 =  BB6 C
2520 = C569 9
2530 = 4780 0
2540 = 3141 6
2550 = B39B D
2560 = 4D3C 2
2570 = E534 F
2580 = C8BF 7
2590 = 1891 A
2600 = CEB1 B
2610 = 226C 5
2620 = 9719 4
2630 = 13BA C
2640 = 9C87 9
2650 = 6911 8
2660 = DB63 3
2670 = 6457 8
2680 = 7296 F
2690 = 6D4C 4
2700 = BFBA 6
2710 =   D6 9
2720 = C06B D
2730 = F4CC F
2740 = 887D 4
2750 = A1BF D
2760 = CD6E D
2770 = 6E74 A
2780 = 7938 E
2790 = CF8A 2
2800 = 5127 6
2810 = 38BD 6
2820 =  23F 4
2830 = 51D9 5
2840 = F979 A
2850 = E531 A
2860 = 9719 3
2870 = A088 6
2880 = 6911 0
2890 = 6717 F
2900 = 3D45 B
2910 =  BB6 1
2920 = 40F9 4
2930 = 4780 A
2940 = 52D6 1
2950 = F341 6
2960 = 926C E
2970 = F1EE 1
2980 = 227F D
2990 = 2C83 2
3000 = C883 6
3010 = 9719 0
3020 = A7B2 9
3030 = 7488 2
3040 = C8FC 7
3050 = 9719 0
3060 = 2470 F
```

Computer Holiday for young people!!

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Strip for action

Jason Smith offers an easy way to label a program's function keys

HAVE you ever wanted to produce a function key strip for one of your programs but couldn't be bothered to go to the trouble of drawing one? If you have, here is the answer. Using this program you can easily produce a strip similar in apperance to the ones supplied with View and ViewSheet.

The printed output is in the form of a grid, ten boxes long and three high, with one box for Control+key, one for Shift+key and one for solo key definitions. A box consists of two lines of text which can be up to 12 characters in length. The text is left-justified but you might like to experiment here.

The program is simple to operate and is error-trapped. If an error is reported you have the choice of continuing or ending the program. For example, if a disc error occurs when saving a key strip you can continue without losing everything you've entered.

The program was designed for the BBC Micro, Master and Compact function keys and, although it will run on the Electron but the printout would have to be altered for this machines.

The program was written for a Star LC-10, but it should work on any Epson-compatible printer that can handle superscript text at 20cpi (characters per inch) with the line spacing set to 17/216 inch (roughly equivalent to 6/72 inch). If your printer can't cope with one or more of these codes the control codes for the printer are held in the string variables in lines 300 to 340. Look up the codes in your printer's manual and change them if necessary.

Enter Listing I, use the checksums to ensure you've made no errors, save and then run it. You will be presented with a menu. Here's what each of the options does:

- To enter a new key strip, or to alter an existing one, press option one. You will be presented with a green three by one grid with the key number in white at the top of the screen.

Pressing the up/down cursor keys enables you to move through the definitions for the 10 function keys and, by pressing 1, 2 or 3 at any time you can enter text into any of the boxes for the key displayed at the top. Pressing 4 returns you to the menu.

- To print your key strip, set the printer On Line, and press option two. You will be asked if you want to print. If you respond Y, the printer will begin printing after a short delay. Pressing N returns you to the menu.
- Option three enables you to load a previously defined key strip. Enter the filename and press Return. If you respond Y to the question *Load this key strip? Y/N*, the key strip will be loaded. If you respond N, you will be returned to the menu.
- Pressing option four allows you to save the current key strip. Enter the filename and press Return. Pressing Y at the prompt, saves the current strip under the above name and N returns you to the menu.
- Option five allows you to exit the program. Pressing Y ends the program. Pressing N returns you to the menu.
- Pressing option six enables you to erase the current key strip from memory. Responding Y to the question clears the memory while N returns you to the menu.
- Finally, pressing asterisk allows you to give an operating system command. The ➤

MAIN PROCEDURES

oscli	Used instead of OSCLI command for compatibility with Basic I.
get_yn	Used for obtaining either a Y or an N input.
d_hgt_undln	Produces double height underlined text.
d_hgt	Produces double height text.
sing_hgt	Produces single height text.
print	Prints out the key strip.
main	Produces the menu.
menu	Displays the menu options.
col	Returns the printer colour for the specified number (Listing II only).
title	Prints the program title on the screen.
colours	Enables you to select the printing colours (Listing II only).
exit	Exits the program.
clear_mem	Clears the memory.
load	Loads a function key strip.
save	Saves current function key strip.
gt	Input a string of characters up to a certain length.

MAIN VARIABLES

fk$(6,9)	Holds the text for each of the keys.
fk2$(6,9)	Used by the print procedure to hold the text, any spaces necessary to make the string 13 characters long and any printer colour codes.
txt_col	Text colour for printout (Listing II only).
grd_col	Grid colour on printout (Listing II only).
sup_on$	Printer codes for superscript text.
sup_off$	Printer codes for cancelling superscript text.
cond$	Printer codes for condensed text.
elite$	Printer codes for Elite text (12cpi).
lne_spc$	Printer codes for line spacing of 17/216 inch (or 6/72 inch).
grid_col$	Printer codes for selecting grid colour (Listing II only).
choice$	Key pressed from main menu.

➤ paged mode is enabled so, for example, you can catalogue a long disc without it all vanishing off the screen. Pressing Shift allows you to scroll the screen and pressing the spacebar when the command has been executed returns you to the menu.

If you own a Star LC-10 colour printer, add Listing II to the program, giving you the option of choosing the printing colours for the grid and the text. This extra option is obtained by selecting option seven and you are asked to press the number of the colour you wish to use for the grid colour and then for the text colour.

When you have entered both you are asked if they are correct. Pressing Y returns you to the menu, while N allows you to re-enter them. The only other difference between the colour and black/white versions is that you are told what the printing colours are when you ask to print.

● *And that's all there is to it. Happy printing!*

Listing I

```
   10 REM Function Key Strip Generator
   20 REM by Jason Smith
   30 REM (c) The Micro User
   40 MODE129
   50 ON ERROR VDU4,26:CLS:PROCerr
   60 VDU23;8202;0;0;0;
   70 DIMfk$(6,9),fk2$(6,9)
   80 VDU23,224,24,24,24,24,126,60,24,0,
23,225,0,24,60,126,24,24,24,24
   90 PROCmain
  100 END
  110 DEFPROCprint
  120 CLS:PROCtitle
  130 COLOUR2:PROCsing_hgt("PRINT KEY ST
RIP",-1,4)
  140 COLOUR1:PROCsing_hgt("Do you wish
to print? Y/N",-1,25)
  150 get$=FNget_yn:IFget$="N"ENDPROC
  160 prnt_buff%=ADVAL(-4)
  170 VDU2:I%=0
  180 REPEAT
  190 I%=I%+1
  200 VDU1,0
  210 UNTIL I%=200 OR ADVAL(-4)<10
  220 VDU3:TIME=0:REPEATUNTILTIME>10
  230 IF ADVAL(-4)<>prnt_buff% COLOUR3:V
DU7:PROCsing_hgt("Printer is not ready!"
,-1,29):PROCwait(250):CLS:ENDPROC
  240 COLOUR0:VDU28,0,1,1,0
  250 FORb=1 TO 6 STEP 2:FORa=0 TO 9
  260 c=b+1:fk2$(b,a)=fk$(b,a):fk2$(c,a)
=fk$(c,a)
  270 fk2$(b,a)=" "+fk2$(b,a)+STRING$(13
-LENfk2$(b,a)," ")
  280 fk2$(c,a)=" "+fk2$(c,a)+STRING$(13
-LENfk2$(c,a)," ")
  290 NEXT:NEXT
  300 sup_off$=CHR$1+CHR$27+CHR$1+CHR$84
  310 sup_on$=CHR$1+CHR$27+CHR$1+CHR$83+
CHR$1+CHR$48
  320 cond$=CHR$1+CHR$15
  330 elite$=CHR$1+CHR$27+CHR$1+CHR$77
  340 lne_spc$=CHR$1+CHR$27+CHR$1+CHR$51
+CHR$1+CHR$17
  350 VDU2:PRINTsup_on$;elite$;cond$;lne
_spc$
  360 line2$=STRING$(14,"-")+"+":line$="
+"+STRING$(8,"-")+"+"+STRING$(10,line2$)
  370 PRINTline$
  380 PRINT"|";SPC1;sup_off$;"CTRL";sup_
on$;SPC3;"|";fk2$(1,0);"|";fk2$(1,1);"|"
;fk2$(1,2);"|";fk2$(1,3);"|";fk2$(1,4);"
|";fk2$(1,5);"|";fk2$(1,6);"|";fk2$(1,7)
;"|";fk2$(1,8);"|";fk2$(1,9);"|"
  390 PRINT"|";SPC8;"|";fk2$(2,0);"|";fk
2$(2,1);"|";fk2$(2,2);"|";fk2$(2,3);"|";
fk2$(2,4);"|";fk2$(2,5);"|";fk2$(2,6);"|
";fk2$(2,7);"|";fk2$(2,8);"|";fk2$(2,9);
"|"
  400 PRINTline$
  410 PRINT"|";SPC1;sup_off$;"SHIFT";sup
_on$;SPC2;"|";fk2$(3,0);"|";fk2$(3,1);"|
";fk2$(3,2);"|";fk2$(3,3);"|";fk2$(3,4);
"|";fk2$(3,5);"|";fk2$(3,6);"|";fk2$(3,7
);"|";fk2$(3,8);"|";fk2$(3,9);"|"
```

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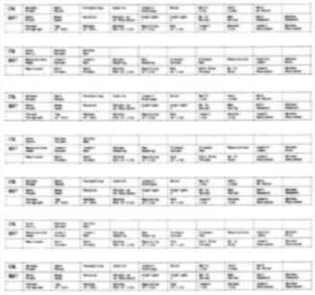
```
  420 PRINT"|";SPC8;"|";fk2$(4,0);"|";fk
2$(4,1);"|";fk2$(4,2);"|";fk2$(4,3);"|";
fk2$(4,4);"|";fk2$(4,5);"|";fk2$(4,6);"|
";fk2$(4,7);"|";fk2$(4,8);"|";fk2$(4,9);
"|"
  430 PRINTline$
  440 PRINT"|";SPC8;"|";fk2$(5,0);"|";fk
2$(5,1);"|";fk2$(5,2);"|";fk2$(5,3);"|";
fk2$(5,4);"|";fk2$(5,5);"|";fk2$(5,6);"|
";fk2$(5,7);"|";fk2$(5,8);"|";fk2$(5,9);
"|"
  450 PRINT"|";SPC8;"|";fk2$(6,0);"|";fk
2$(6,1);"|";fk2$(6,2);"|";fk2$(6,3);"|";
fk2$(6,4);"|";fk2$(6,5);"|";fk2$(6,6);"|
";fk2$(6,7);"|";fk2$(6,8);"|";fk2$(6,9);
"|"
  460 PRINTline$
  470 VDU3,26
  480 ENDPROC
  490 DEFPROCsing_hgt(text$,X,Y):VDU4
  500 IFX=-1 X=(40-LENtext$)/2
  510 PRINTTAB(X,Y);text$:ENDPROC
  520 DEFPROCd_hgt_undln(text$,X,Y)
  530 IFX=-1 X=(40-LENtext$)/2
  540 A%=10:X%=&70:Y%=0
  550 VDU31,X,Y
  560 FORchar%=1 TO LEN text$
  570 ?&70=ASCMID$(text$,char%)
  580 CALL&FFF1
  590 VDU23,255,?&71,?&71,?&72,?&72,?&73
,?&73,?&74,?&74,255,8,10,23,255,?&75,?&7
5,?&76,?&76,?&77,?&77,?&78,?&78,255,11
  600 NEXT
  610 VDU23,255,0,255,0,0,0,0,0,0
  620 PRINTTAB(X,Y+2);STRING$(LENtext$,C
HR$255):ENDPROC
  630 DEFPROCd_hgt(text$,X,Y)
  640 MOVEX,Y
  650 A%=10:X%=&70:Y%=0
  660 FORchar%=1 TO LEN text$
  670 ?&70=ASCMID$(text$,char%)
  680 CALL&FFF1
  690 VDU23,255,?&71,?&71,?&72,?&72,?&73
,?&73,?&74,?&74,255,8,10,23,255,?&75,?&7
5,?&76,?&76,?&77,?&77,?&78,?&78,255,11:N
EXT:ENDPROC
  700 DEFPROCmain
  710 PROCmenu
  720 REPEAT
  730 choice$=GET$
  740 IFchoice$="1" PROCalter_strip(0):P
ROCmenu
  750 IFchoice$="2" PROCprint:PROCmenu
  760 IFchoice$="3" PROCload:PROCmenu
  770 IFchoice$="4" PROCsave:PROCmenu
  780 IFchoice$="5" PROCexit:PROCmenu
  790 IFchoice$="6" PROCclear_mem:PROCme
nu
  800 IFchoice$="*" PROCos_command:PROCm
enu
  810 UNTIL0
  820 ENDPROC
  830 DEFPROCmenu
  840 PROCoscli("FX11,0"):CLS:PROCtitle:
COLOUR2
  850 ypos=7:RESTORE2330
  860 REPEAT
  870 READkey$,text$
  880 IFkey$<>"END" PROCsing_hgt("("+key
$+") "+text$,10,ypos):ypos=ypos+3
  890 UNTILkey$="END":ENDPROC
  900 DEFPROCalter_strip(f_key)
  910 CLS:PROCtitle
  920 VDU19,1,2;0;19,2,6;0;
  930 GCOL0,1:MOVE283,730:DRAW996,730:DR
AW996,385:DRAW283,385:DRAW283,730:MOVE99
6,615:DRAW283,615:MOVE283,500:DRAW996,50
0:MOVE545,730:DRAW545,385
  940 GCOL0,1:VDU5
  950 PROCd_hgt("CTRL",320,707):PROCd_hg
t("SHIFT",320,590)
  960 PROCdisplay_strip(f_key)
  970 REPEAT
  980 VDU4,28,0,31,39,22:CLS
  990 COLOUR3:PROCsing_hgt("Select box:
(1) CTRL",9,0)
 1000 PROCsing_hgt("(2) SHIFT",21,2)
 1010 PROCsing_hgt("(3) BLANK",21,4)
 1020 PROCsing_hgt("(4) EXIT",21,6)
 1030 PROCsing_hgt("Use "+CHR$224+CHR$22
5+" to move through entries",-1,8)
 1040 REPEAT
 1050 PROCoscli("FX4,1")
 1060 get$=GET$
 1070 IFASCget$<>138 AND ASCget$<>139 GO
TO1130
 1080 IFASCget$=138 AND f_key>0 f_key=f_
key-1:GOTO1120
 1090 IFASCget$=138 AND f_key=0 f_key=9:
GOTO1120
 1100 IFASCget$=139 AND f_key<9 f_key=f_
key+1:GOTO1120
 1110 IFASCget$=139 AND f_key=9 f_key=0
 1120 PROCdisplay_strip(f_key):GOTO1140
 1130 IFVALget$<1 OR VALget$>4 PROCsound
 ELSEbx=VALget$
 1140 UNTILVALget$>=1 AND VALget$<=4
 1150 IFbx=4 GOTO1270
 1160 VDU4,28,0,31,39,22:CLS
 1170 IFbx=1 b$="CTRL":lne_no=1 ELSEIFbx
=2 b$="SHIFT":lne_no=3 ELSEIFbx=3 b$="BL
ANK":lne_no=5
```



➤

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(3 lines)

```
 1180 PROCsing_hgt(b$,-1,1)
 1190 PRINTTAB(10,3);"Line 1: "
 1200 PROCgt(18,3,12)
 1210 fk$(lne_no,f_key)=get$
 1220 PRINTTAB(10,5);"Line 2: "
 1230 PROCgt(18,5,12)
 1240 fk$(lne_no+1,f_key)=get$
 1250 PROCclear_box(bx)
 1260 PROCwrite_in_box(bx)
 1270 UNTILbx=4:VDU4,26:PROCoscli("FX4")
:ENDPROC
 1280 DEFPROCclear_box(box)
 1290 GCOL0,128
 1300 VDU24,556;(707-((box-1)*115))-80;9
90;717-((box-1)*115);
 1310 CLG:VDU24,0;0;1279;1023;:ENDPROC
 1320 DEFPROCwrite_in_box(box):box_pos=(
(box-1)*2)+1
 1330 MOVE576,707-((box-1)*115)
 1340 VDU5:GCOL0,2:PRINT;fk$(box_pos,f_k
ey)
 1350 MOVE576,707-((box-1)*115)-42
 1360 PRINT;fk$(box_pos+1,f_key):ENDPROC
 1370 DEFPROCgt(x,y,ln)
 1380 PROCoscli("FX11,50")
 1390 VDU31,x,y:get$=""
 1400 VDU23,254,0,0,0,0,0,0,255,255
 1410 REPEAT:PRINTTAB(x,y);get$;CHR$254
 1420 G=GET
 1430 IFLENget$=ln AND (G<>13 AND G<>127
) GOTO1420
 1440 IFG=13 PRINTTAB(x,y);get$;" "
 1450 IFG=127 get$=LEFT$(get$,LENget$-1)
:PRINTTAB(x,y);get$;CHR$254;" "
 1460 IFG>31 AND G<127 get$=get$+CHR$G:P
RINTTAB(x,y);get$;CHR$254
 1470 UNTILG=13:PROCoscli("FX11,0"):ENDP
ROC
 1480 DEFPROCsave
 1490 CLS:PROCtitle
 1500 COLOUR2:PROCsing_hgt("SAVE KEY STR
IP",-1,4)
 1510 COLOUR3:PROCsing_hgt("Filename: ",
9,15)
 1520 PROCgt(19,15,10):filename$=get$
 1530 COLOUR1:PROCsing_hgt("Save current
 key strip? Y/N",-1,19)
 1540 get$=FNget_yn:IFget$="N"ENDPROC
 1550 qq=OPENOUTfilename$
 1560 COLOUR2:PROCsing_hgt("Saving",-1,2
3)
 1570 FORa=0 TO 9:FORb=1 TO 6:PRINT#qq,f
k$(b,a):NEXT:NEXT
 1580 CLOSE#qq
 1590 COLOUR2:PROCsing_hgt("Saving Compl
ete",-1,23):PROCwait(250):ENDPROC
 1600 DEFPROCload
 1610 CLS:PROCtitle
 1620 COLOUR2:PROCsing_hgt("LOAD KEY STR
IP",-1,4)
 1630 COLOUR3:PROCsing_hgt("Filename: ",
10,15)
 1640 PROCgt(20,15,10):filename$=get$
 1650 COLOUR1:PROCsing_hgt("Load this ke
y strip? Y/N",-1,19)
 1660 get$=FNget_yn:IFget$="N"ENDPROC
 1670 qq=OPENINfilename$
 1680 COLOUR2:PROCsing_hgt("Loading",-1,
23)
 1690 FORa=0 TO 9:FORb=1 TO 6:INPUT#qq,f
k$(b,a):NEXT:NEXT
 1700 CLOSE#qq
 1710 COLOUR2:PROCsing_hgt("Loading Comp
lete",-1,23):PROCwait(250):ENDPROC
 1720 DEFPROCtitle
 1730 VDU19,1,1;0;19,2,3;0;19,3,7;0;
 1740 COLOUR3:GCOL0,3
 1750 PROCd_hgt_undln("Function Key Stri
p Generator",-1,0):ENDPROC
```

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```
 1760 DEFPROCwait(delay)
 1770 time=TIME
 1780 REPEAT UNTIL TIME-time>=delay
 1790 ENDPROC
 1800 DEFPROCsound
 1810 SOUND1,-15,4,2
 1820 SOUND1,0,0,0
 1830 ENDPROC
 1840 DEFPROCoscli($&700)
 1850 Y%=&700 DIV256
 1860 X%=&700 MOD256
 1870 CALL&FFF7
 1880 ENDPROC
 1890 DEFPROCexit
 1900 CLS:PROCtitle
 1910 COLOUR2:PROCsing_hgt("EXIT PROGRAM
",-1,4)
 1920 COLOUR3:PROCsing_hgt("Are you sure
? Y/N",-1,16)
 1930 get$=FNget_yn:IFget$="N"ENDPROC EL
SECLS:PROCd_hgt_undln("Goodbye!",-1,13):
END
 1940 DEFFNget_yn
 1950 REPEAT
 1960 get$=GET$:CAP$=CHR$(ASCget$ AND &D
F)
 1970 IFCAP$<>"Y" AND CAP$<>"N" PROCsoun
d
 1980 UNTILCAP$="Y" OR CAP$="N"
 1990 =CAP$
 2000 DEFPROCdisplay_strip(f_key)
 2010 VDU4,26
 2020 COLOUR3:PROCd_hgt_undln("f"+STR$f_
key,-1,4)
 2030 VDU28,0,31,39,22
 2040 FORa=1 TO 3:PROCclear_box(a):NEXT
 2050 GCOL0,2:VDU5
 2060 FORa=1 TO 3:PROCwrite_in_box(a):NE
XT
 2070 ENDPROC
 2080 DEFPROCos_command
 2090 CLS:PROCtitle
 2100 COLOUR2:PROCsing_hgt("ENTER STAR C
OMMAND",-1,4)
 2110 COLOUR3:PROCsing_hgt("Press SHIFT
to scroll the screen",-1,6):VDU28,0,26,3
```

Get it right ✓

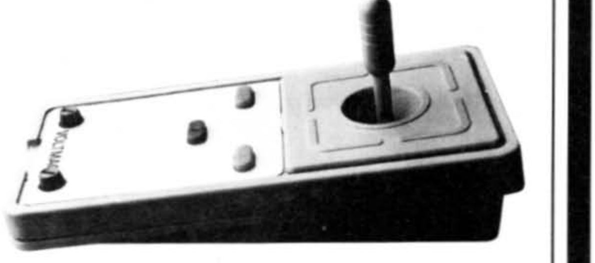
```
  10 =    0 0  |   480 = ED0F 8  |   950 = BE70 3  |  1420 =  EBB 5  |  1890 = 8ABD 0
  20 =    0 0  |   490 = 6479 D  |   960 = 4183 E  |  1430 = 9587 3  |  1900 = 18DC A
  30 =    0 0  |   500 = BB2B 3  |   970 = BFBA B  |  1440 =  4E3 7  |  1910 =  A40 2
  40 = ACED D  |   510 = 65B8 A  |   980 = A5BD C  |  1450 = B2D2 5  |  1920 = 8A89 C
  50 = 49D3 5  |   520 = DB2E 3  |   990 = 7F20 5  |  1460 = ADD9 7  |  1930 = 25C8 0
  60 = F716 6  |   530 = BB2B 2  |  1000 = 8664 7  |  1470 = 1A56 2  |  1940 =  C48 1
  70 = A08B 7  |   540 =  ACA 4  |  1010 = 609E 1  |  1480 = 7A2C 5  |  1950 = BFBA 2
  80 =  4D8 8  |   550 = D29D 9  |  1020 = F1E9 3  |  1490 = 18DC 0  |  1960 = 3D20 7
  90 = 8B00 7  |   560 = 8565 1  |  1030 = D1FA 2  |  1500 =  D34 2  |  1970 =  F5E 4
 100 = FD2E 3  |   570 = EBBB A  |  1040 = BFBA 7  |  1510 = AB3D 3  |  1980 = D590 8
 110 = 10CF 6  |   580 = 8B74 F  |  1050 =  7F4 5  |  1520 = C4C0 0  |  1990 = 9810 8
 120 = 18DC C  |   590 = CD50 8  |  1060 = 4A8C 4  |  1530 = 80CE 9  |  2000 =  730 4
 130 = 544A 0  |   600 = 2C83 3  |  1070 = 8793 D  |  1540 = 30B4 1  |  2010 = 7E28 1
 140 = E23D C  |   610 = 7CD8 6  |  1080 = 2737 1  |  1550 = A8C5 1  |  2020 = 3095 D
 150 = 30B4 1  |   620 = 4AF6 B  |  1090 = D178 6  |  1560 = 3FAB 6  |  2030 = 85A8 2
 160 = FDF4 4  |   630 = 20E0 1  |  1100 = E8E5 4  |  1570 = 7F2D A  |  2040 = 599D 7
 170 = C9C1 E  |   640 = B4E0 3  |  1110 = B4E7 2  |  1580 = D13C F  |  2050 = B04A 7
 180 = BFBA 6  |   650 =  ACA F  |  1120 = BB69 E  |  1590 = C4ED 6  |  2060 = EE02 9
 190 = A10E C  |   660 = 8565 B  |  1130 = 73C5 8  |  1600 = 24A1 4  |  2070 = ED0F 1
 200 = D749 D  |   670 = EBBB E  |  1140 = ED15 0  |  1610 = 18DC E  |  2080 = 4F81 D
 210 =  C67 8  |   680 = 8B74 8  |  1150 = F50B 0  |  1620 = BF6F D  |  2090 = 18DC 5
 220 = 2B65 B  |   690 = 759F 5  |  1160 = A5BD 7  |  1630 = B606 D  |  2100 = A3DC D
 230 = F973 6  |   700 = 61F7 4  |  1170 = 8CC9 F  |  1640 = E0F5 F  |  2110 = 7916 2
 240 = 28B2 2  |   710 = 6D0D E  |  1180 = FDDF 4  |  1650 = 6F7F 9  |  2120 = 98BB 5
 250 = 23D6 F  |   720 = BFBA F  |  1190 = 99E0 6  |  1660 = 30B4 B  |  2130 = 968E A
 260 = 17A2 C  |   730 = 1549 2  |  1200 = 58F3 E  |  1670 = 91C8 E  |  2140 = 5B81 6
 270 = DEB9 0  |   740 = E85B D  |  1210 = DA59 0  |  1680 = B5F2 9  |  2150 = ED0F 5
 280 = E602 6  |   750 = D6FC 9  |  1220 = 8D57 8  |  1690 = F6DE B  |  2160 = 24C8 F
 290 = 24BD C  |   760 = F99F 0  |  1230 = 9576 7  |  1700 = D13C C  |  2170 = 6A1D F
 300 = 12C9 6  |   770 = 7A04 7  |  1240 = CD4A 8  |  1710 = 7450 B  |  2180 = 8D01 C
 310 = DC5C D  |   780 = 1C02 4  |  1250 = D527 2  |  1720 = F931 7  |  2190 = C7B1 9
 320 = D4B5 3  |   790 = 63E3 5  |  1260 =  9F4 4  |  1730 = 9283 2  |  2200 = 2E36 D
 330 = D1A7 5  |   800 = 761B 7  |  1270 = 5137 2  |  1740 = ECF6 1  |  2210 = 9274 1
 340 = AB01 B  |   810 = 53CE C  |  1280 = 6CCE C  |  1750 = E157 2  |  2220 = 67AC A
 350 = 2C6A 9  |   820 = ED0F 8  |  1290 = 5472 7  |  1760 = 8A16 4  |  2230 = F304 C
 360 = B98A C  |   830 = 87FA 9  |  1300 = 62A0 8  |  1770 =  203 1  |  2240 = 9293 8
 370 = FC1D 4  |   840 = 1AE7 7  |  1310 = A059 D  |  1780 = A11A C  |  2250 = ED0F 3
 380 = 3D67 0  |   850 = 4392 B  |  1320 = 3A88 B  |  1790 = ED0F C  |  2260 = A7A8 0
 390 = 3360 5  |   860 = BFBA 4  |  1330 = 4C2A 8  |  1800 = F80F 3  |  2270 = 18DC B
 400 = FC1D C  |   870 = ADA3 1  |  1340 = B65D F  |  1810 = 2F99 8  |  2280 = 7FE2 3
 410 = 3A53 C  |   880 = F43A C  |  1350 = 9A36 7  |  1820 = 2260 2  |  2290 = DFDA 8
 420 = F86E 5  |   890 = 3634 9  |  1360 = A98A A  |  1830 = ED0F 2  |  2300 = 4A39 D
 430 = FC1D F  |   900 = 5CDC 1  |  1370 = 559D 8  |  1840 = 8AB8 9  |  2310 = 970F 6
 440 = 2B0C 3  |   910 = 18DC 8  |  1380 = 7CFB A  |  1850 = 5AA0 2  |  2320 = ED0F 0
 450 = 4E8B 8  |   920 =  2D0 8  |  1390 = 29C5 C  |  1860 = B4BD 4  |  2330 = 1D21 5
 460 = FC1D 9  |   930 = CDCD 9  |  1400 = BFB2 0  |  1870 = EBB2 5  |
 470 = 2F05 5  |   940 = 2B96 C  |  1410 = BF02 1  |  1880 = ED0F 6  |
9,8,14:INPUTTAB(0,0)"*"command$
 2120 PRINT:PROCoscli(command$)
 2130 VDU26,15:COLOUR1:PROCsing_hgt("Pre
ss SPACE BAR to continue...",-1,28)
 2140 REPEATUNTILGET=32
 2150 ENDPROC
 2160 DEFPROCerr
 2170 VDU4,26:COLOUR2:PROCd_hgt_undln("E
RROR",-1,0):COLOUR3
 2180 PRINT:REPORT:PRINT" at line ";ERL'
 2190 COLOUR1:PROCsing_hgt("Press SPACE
BAR to contine",-1,28)
 2200 PROCsing_hgt("or ESCAPE to end",-1
,30)
 2210 PROCoscli("FX229,1")
 2220 REPEAT:get$=GET$:UNTILget$=CHR$32
ORget$=CHR$27
 2230 PROCoscli("FX229"):PROCoscli("FX12
"):COLOUR3
 2240 IFget$=CHR$27 END ELSEPROCmain
 2250 ENDPROC
 2260 DEFPROCclear_mem
 2270 CLS:PROCtitle
 2280 COLOUR2:PROCsing_hgt("CLEAR MEMORY
",-1,4)
 2290 COLOUR3:PROCsing_hgt("Are you sure
? Y/N",-1,15)
 2300 get$=FNget_yn:IFget$="N" ENDPROC
 2310 FORb=1TO6:FORa=0TO9:fk$(b,a)="":NE
XT:NEXT
 2320 ENDPROC
 2330 DATA 1,Enter key details,2,Print k
ey strip,3,Load key strip,4,Save key str
ip,5,Exit program,6,Clear memory,*,Star
Command,END,END
```

Listing II

```
   81 txt_col=0:grd_col=0
  131 COLOUR3:PROCsing_hgt("Grid Colour:
 "+FNcol(grd_col),11,8):PROCsing_hgt("Te
xt Colour: "+FNcol(txt_col),11,11)
  281 fk2$(b,a)=CHR$1+CHR$27+CHR$1+CHR$1
14+CHR$1+CHR$txt_col+fk2$(b,a)+CHR$1+CHR
$27+CHR$1+CHR$114+CHR$1+CHR$grd_col
  282 fk2$(c,a)=CHR$1+CHR$27+CHR$1+CHR$1
14+CHR$1+CHR$txt_col+fk2$(c,a)+CHR$1+CHR
$27+CHR$1+CHR$114+CHR$1+CHR$grd_col
  341 grid_col$=CHR$1+CHR$27+CHR$1+CHR$1
14+CHR$1+CHR$grd_col
  350 VDU2:PRINTsup_on$;elite$;cond$;lne
_spc$;grid_col$
  791 IFchoice$="7" PROCcolours:PROCmenu
  850 ypos=7:RESTORE2480
 2330 DEFPROCcolours
 2340 CLS:PROCtitle:PROCoscli("FX11,0")
 2350 REPEAT
 2360 PRINTTAB(10,6);"Grid Colour (0-6):
"SPC15
 2370 get$=GET$:IFASCget$<48 OR ASCget$>
54 PROCsound ELSEPRINTTAB(29,6);VALget$:
grd_col=VALget$
 2380 UNTILASCget$>=48 AND ASCget$<=54
 2390 REPEAT
 2400 PRINTTAB(10,9);"Text Colour (0-6):
"SPC15
 2410 get$=GET$:IFASCget$<48 OR ASCget$>
54 PROCsound ELSEPRINTTAB(29,9);VALget$:
txt_col=VALget$
 2420 UNTILASCget$>=48 AND ASCget$<=54
 2430 PROCsing_hgt("Are these correct? Y
/N",-1,29)
 2440 get$=FNget_yn:IFget$="Y"CLS ELSEIF
get$="N"VDU28,0,31,39,3:CLS:VDU26:GOTO23
50
 2450 ENDPROC
 2460 DEFFNcol(c)
 2470 IFc=0 ="BLACK"ELSEIFc=1 ="RED"ELSE
IFc=2 ="BLUE"ELSEIFc=3 ="PURPLE"ELSEIFc=
4 ="YELLOW"ELSEIFc=5 ="ORANGE"ELSEIFc=6
="GREEN" ELSE=""
 2480 DATA 1,Enter key details,2,Print k
ey strip,3,Load key strip,4,Save key str
ip,5,Exit program,6,Clear memory,7,Chang
e print colours,*,Star Command,END,END
```

Get it right ✓

```
 81 = F1A8   2330 = D2F2   2410 = EBFC
131 = 7865   2340 = AF97   2420 = 7075
281 =  C08   2350 = BFBA   2430 = 52A9
282 = B8D6   2360 = 3768   2440 = E0AA
341 = F5E3   2370 = 3518   2450 = ED0F
350 =  7A4   2380 = 7075   2460 = 5B20
791 = E8E9   2390 = BFBA   2470 = 62EA
850 = 2C79   2400 = 935F   2480 = F03C
```



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4Mb of RAM for your A310 or A305 is now just £350. (£304.35+VAT)

(This includes a free MEMC1a worth nearly £80 - limited offer.)

Hardware compatibility; This RAM expansion is fully compatible with ARM3 boards. Naturally, it also allows upgrades such as backplanes and hard discs to be fitted too.

Software compatibility; The 4Mb of memory is functionally identical to that in a 440/1. Your computer automatically detects and makes use of the extra RAM. A must for desktop publishing.

MEMC1a; The newer range of Archimedes machines (eg. 400 series) are fitted with an enhanced memory controller, MEMC1a. This boosts performance by about 10%, and is also necessary for upgrades such as ARM3s. The MEMC1a may also be fitted to an A310. **While current stocks last, a MEMC1a (RRP £79.35) will be included free of charge with the 4MB RAM board.**

You can obtain a free information pack on this upgrade by ringing (0752) 847286, or write to the address below. Not only does this explain the installation procedure, **but also covers the use of larger OS ROMs.**

A3000 corner

2Mb (total), £69. May be upgraded to 4Mb later.
4Mb (total), £220. **Prices include VAT**
Bare board, £29.

The bare board may be turned into a 2Mb or 4Mb expansion simply by plugging eight memory chips into the high quality sockets. A data sheet is available free of charge which explains the type of chips needed.

4-slot backplane for A310. Now widely recognised as *the* backplane for 300 series computers. Four-layer board gives superior reliability by reducing electrical noise. Also available from Beebug. Recommended by Oak Computers for use with their range of SCSI drives. Simple to fit, complete with fan and full instructions.

£66 incl. VAT.

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IFEL (Interface Electronics), 36 Upland Drive, Derriford, Plymouth PL6 6BD. (0752) 847286.

A big plus for WordWise

Ian Waugh takes on Corplan as it attempts to manage his WordWise files

WORDWISE Plus, as well as Wordwise Plus II, is one of the most popular wordprocessors for the BBC Micro. Apart from being easy to use – even though its critics denounce its distinctly non-wysiwyg text edit area – it contains an extremely powerful programming language, WPPL (Wordwise Plus Programming Language).

This can be used to write very sophisticated text and document processing routines which are able to integrate perfectly into the system.

```
(C) C W Robertson 1989

***** C O R P L A N *****
Correspondence Plan for Wordwise +

Model B - DFS
```

Corplan is a suite of such programs which load into WW+ segments providing complementary word processing facilities for both home and business users and include document indexing, mailmerge and form selection.

Corplan will run on just about any configuration of BBC Micro and filing system – DFS, ADFS and the Watford and Opus systems. It takes advantage of the extra features such as date stamping – if available – and it will run with Hi Wordwise Plus.

The minimum recommended disc drive configuration is twin 40 track single sided drives – at present it isn't suitable for use with a hard disc.

It expects to find an Epson-compatible printer at the end of the computer parallel port but you can, of course, alter the printer configuration.

What you get

The disc contains 31 files, some are used to run the Corplan system, some are demo and tutorial files while others can be modified to suit your own applications. The first step is to install the required files on to a work disc, a procedure very well covered in the manual.

The Main Menu has six options, the first four leading to other sections of Corplan while options five and six are used to change the current and default document sources.

The first option is for scanning and selecting index entries. The Document Indexing facility lets you give documents a name of up to 30 characters. I was never happy with the limitations imposed by the seven-character limit of the DFS. The extra three characters of the ADFS make all the difference, but 30 is luxury indeed.

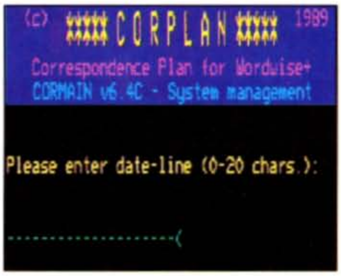
Option two lets you create a new index entry and option three opens the way to text entry mode.

Before dropping into the text area you have the option of loading one of 22 standard forms. Six are supplied with the program and you can modify them or create others without too much difficulty.

Product: Corplan
Price: £19.50
Supplier: Corplan Computer Systems,
Three Gables, 7a Talbots Drive,
Maidenhead, Berkshire SL6 4LZ.
Tel: 0628 24591
Requirements: BBC B, B+ or Master

The forms are especially useful in WW+ as the text edit area is only 40 characters wide and you have to enter preview mode to see the layout. Corplan will insert dates and addresses at predefined points in the form and there is a facility for sending an address to the printer.

The Utilities menu is where you find address labeller and mailmerge facilities. Addresses are stored in a special format which is used to select and extract information required by a document. This is particularly important in the mailmerge operation. You can also access several address files and select a subset of addresses from an address list.



```
(c) ***** C O R P L A N ***** 1989
Correspondence Plan for Wordwise+
CORMAIN v6.4C - System management


Please enter date-line (0-20 chars.):


--------------------(
```

Files are date stamped where possible

Other facilities include an address label printer routine. If you use text files from a number of different sources or use *SPOOLed text you'll find the Text Deformatting utility particularly useful. This removes the bar (|) pad character, leading spaces, single carriage returns and reduces multiple spaces to single spaces.

Making the most

In order to maximise the amount of free memory for documents, Corplan relies extensively on disc files. When you do start work on a document most of the memory is cleared leaving only a small resident recycling program. To reinstate the main program, 12800 bytes must be free. This may be awkward if you consistently create large documents of more than 2,000 words, but this should not be a problem for letters and short reports.

Corplan includes a link to InterWord and supports Spell-Master Dictionaries on machines with sideways ram. The manual is very thorough although the sheer length could prove quite daunting. Once the system is set up, however, all should be plain sailing, as virtually all the options are menu driven.

I've been using Wordwise in its various incarnations since its inception and have created my own system of work files, directories, WPPL programs and templates.

My system may not be perfect but it works and we're used to each other. If you're in a similar situation then a change over to Corplan – or any other document management system – may prove too much of a wrench.

However, if you have trouble finding files, or have yet to organise your documents, you really should check out Corplan. It comes with free user support and a 14 day money-back guarantee so you've nothing to lose and you may just retain a little bit of your sanity.

Summing up

Corplan is a very thorough suite of programs for utilising Wordwise Plus as a document processor for both home and business use. Because of the sheer number of options and facilities, you must be prepared to spend some time setting up your system.

Of sounds, chemical

PD specialist Teri Paul scrutinises the latest releases in the PD world

KICKING off with the Archimedes this month, I received a nice selection of goodies from Mark Johnson. One of his desktop utilties is !Audio which allows you to set the volume level of your Archimedes – useful if you want to play games on the quiet.

To test this out he also sent !Creepie which is very reminiscent of an old BBC game where you must guide a caterpillar around the screen encouraging it to eat as much as possible.

This task is made more difficult by the creature's desire to throw itself off the screen. The Archimedes version is VERY fast – it's almost impossible to live more than a couple of seconds the first time you play.

Shareware debut

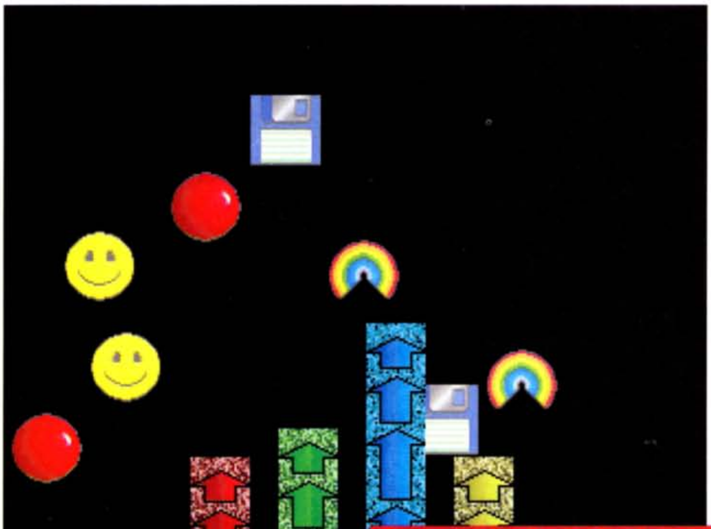
SoftRock Software have entered the PD realm by realising some previously commercially available product as shareware. The difference being that although you can still obtain it from PD libraries, the rights remain with the programmer.

You can look at the PD version, use it and distribute it, but if you want more you can register. You are not free to distribute what you receive on registration, and the same copyright laws apply as if you had bought the product across a shop counter.

Three programs are available for those of you with different accounting skills and needs – Cashbook, CashStock or Cast Nominal Ledger are available at present.

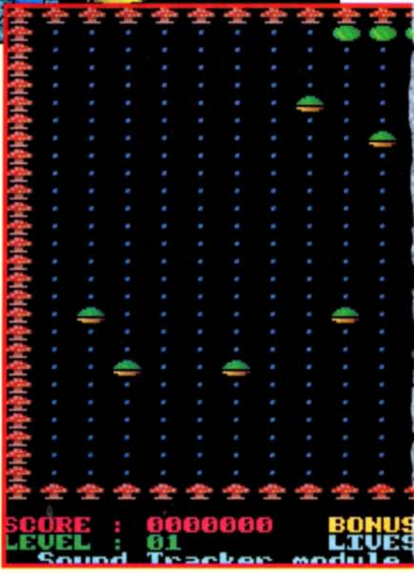
I would recommend the Cashbook if you are unsure if you actually want your accounts on computer, or don't feel your computer skills are up to some of the more comprehensive commercially available packages for the Archimedes.

Once you've tried out the programs send Vince Hudd £5 and you'll get full instructions, the latest version, demo versions of the other programs plus general information. When the finished versions are available commercially in May or June you'll be able to get them at a special discounted price. It's a clever way to market and test programs, and one where everyone benefits.



!BarDemo

Bullwink



ARMageddon

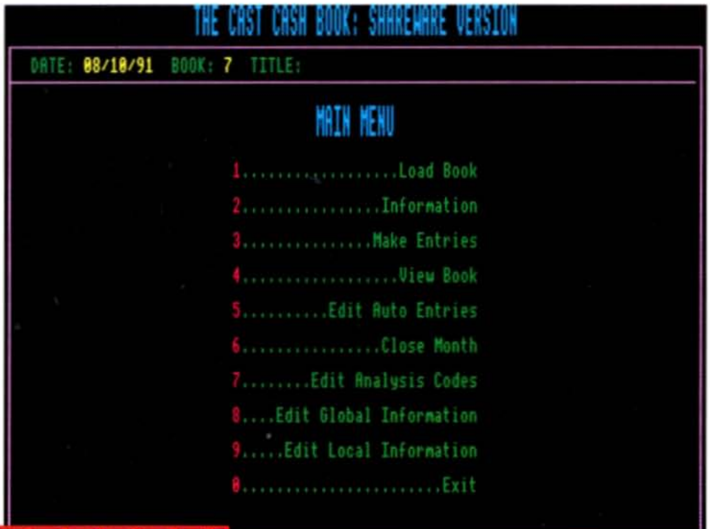
No, it wasn't the end of the world, just some new demos from the ARMageddon programmers who hide beneath the nom de plumes of Bandit and Phantom – I don't know if they're restless but they are natives of Great Wakering not Bonny Scotland.

Their demos are pretty neat, especially the !BarDemo which I've included on this month's subscription disc. They tell me they will dedicate demos on request, so if you're interested contact them directly.

Also new to me were a selection of demos and bits and bobs from Hung Computer Services. I hadn't seen Bullwink before, but he follows a long line including Baby Blues and Man.

They also supplied me with a nice game

sights and equations



```
THE CAST CASH BOOK: SHAREWARE VERSION

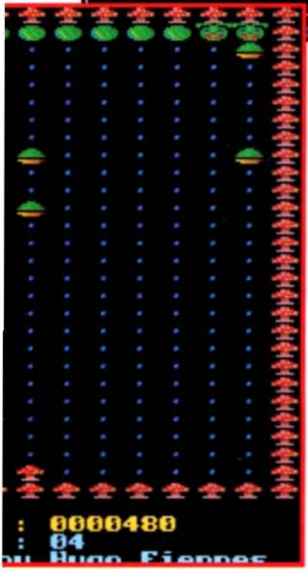
DATE: 08/10/91  BOOK: 7  TITLE:

MAIN MENU

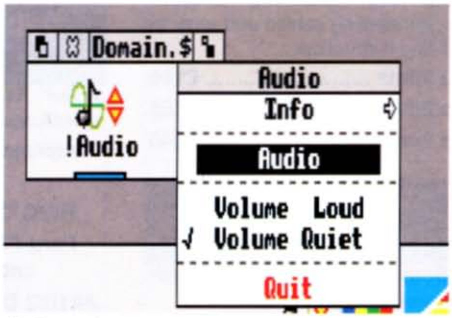
1.................Load Book
2................Information
3...............Make Entries
4..................View Book
5..........Edit Auto Entries
6................Close Month
7........Edit Analysis Codes
8....Edit Global Information
9.....Edit Local Information
0.......................Exit

y Vince M. Hudd of Soft Rock Software
```

Shareware Cashbook



!Creepie



!Audio

of Tetris which I found quite difficult to master, as it uses numbers keys to move the pieces – took some getting used to.

Gripe time

Now I know that there are some brilliant programmers out there, and from the BBC discs I've been sent some superb musicians too, so will someone please tell me why, oh why, the same SoundTracker tunes keep turning up.

I know that they are easily obtained from Amiga bulletin boards, but come on guys, a bit of imagination wouldn't go amiss! Also watch your English and grammar, Brothers in Arm can get away with it as their English sure beats my Norwegian, but what's your excuse?

While we're on the subject, you shouldn't have to have a disc in drive 0 for it to run! Commercial software sometimes falls into this trap from time to time and I find it very annoying. OK – moans are now over.

Archimedes PD Libraries

Arcaynia PD
PO Box 1927
Sutton Coldfield
B74 3QZ

Arch PD
109 Ferry Road
Hullbridge
Hockley
Essex
SS5 6EL

ARMaggedon
17 Lea Lotts
Great Wakering
Southend-on-Sea
Essex
SS3 0HA

Diamond PD
86 Meadow Bank
Moor Lane
Holway
Holywell
Clwyd
CH8 7EF

Digital Phenomena
28 Tooting Bec
Gardens
Streatham
London
SW16 1RB

Hung Computer
Systems
82 Roe Lane
Kingsbury
London
NW9 9BD

KJCM Software
5 Blythefield Avenue
Great Barr
Birmingham
B43 6QG

From the Beeb frontline

New to the BBC are GLM PD, 2 Pierrefondes Avenue, Farnborough, Hampshire GU14 8NF. For £1.50 Gareth Moore will send you a demonstration disc with all sorts of bits and pieces. Unfortunately he can't cope with 3.5in discs at the moment.

Meanwhile Rafael Jay at Red Shift Software has just secured the distribution rights to the old Disk User software. They will not enter the public domain proper as copyright remains with the original publishers. So although you can get your own copy directly from Red Shift, you will not be able to copy the discs and pass them on.

BBC Master owners now have their own PD library courtesy of Andy Nibbs, 2 Seaview, Hoylake L47 2DD, although he is only catering for 5.25in discs – MasterDisc will cost you £1.50.

For the more serious-minded, C. A. McGoughey is compiling a library of chemistry and physics programs for the BBC B. If you have written any programs on these subjects send your discs to him and he'll reciprocate with a disc of his own programs.

If you don't have anything to swop don't despair, for £1 and a blank disc he send you a selection – as always make sure you specify the format you need.

The programs he sent to us certainly rekindled my interest in chemistry and were of general interest too. So if you've forgotten all about, or want to find out about, the blackbody radiation spectrum, AC formulae and the Maxwell Boltzman Distribution Law write to 13 St Mary's Street, Canterbury Kent CT1 2QL.

Dabhand Computing Ltd.

TERMS: UK residents add 15% VAT to all prices, except books. Delivery FREE on all postal items in the UK. Export, no VAT, carriage at cost. (quotations available). Europe maximum £2.50 software, £35 hardware. Access/Visa cards accepted by post/phone/in person. We are authorised Acorn dealers. Official orders accepted from public sector/education/PLCs, otherwise cash with order. Tender invitations welcome. Callers welcome. We are about 800 yds north of J17, M62. Fax: 061-766 8425. Price subject to change without notification. Goods offered subject to being unsold.

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A 440/1	**£1699**
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* Pack includes PC Emulator, 1st Word Plus, Genesis. ** + Acorn DTP.

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20 Mb Internal Hard Disc	£345
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80 Mb Internal Hard Disc	£592
100 Mb Internal Hard Disc	£783
200 Mb Internal Hard Disc	£1125
20 Mb External Hard Disc	£485
45 Mb External Hard Disc	£565
80 Mb External Hard Disc	£727
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1 Gb Tape Drive	£2535
Tape for above	£30
for additional devices deduct	£100

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Econet Module	£46
Ethernet Expansion Card	£249
Floating Point Expansion Card	£449
Hawk V9 Video Digitiser	£339
I/O Expansion Card	£79
Keyboard Extender	£8
Midi Upgrade to I/O Exp. Card	£27
Midi Expansion Card	£65
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Scanlight Senior Scanner A4 (CC)	£389
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VIDC Enhancer	£29

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Fast Samsung Ram complete with step by step fitting instructions.

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2 Mb Ram	**£95**
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Up to 2 Mb Ram + 20 Mb	**£215**
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WorraCAD
RISC OS Extras & Utils Discs
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Pro Artisan
RISC OS Extras & Utils Discs
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Eizo 9060 SZ System	**£1882**

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Impression & Scanlight Junior
Pipedream
RISC OS Extras & Utils Discs
Font FX, Box of discs, printer cable and mouse mat

A410/2 DTP Pack	**£1469**
Colour System	**£1658**
Eizo 9060 SZ System	**£1928**

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Up to 4 Mb Ram	**£95**
Up to 40 Mb Hard Disc	**£116**
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Up to 4 Mb Ram + 40 Mb	**£236**
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Please add these prices to the base system prices quoted above.

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5.25" Single 40/80 no psu	£95
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5.25" Dual 40/80 with psu	£199
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3.5" + 5.25" 40/80 no psu	£185
3.5" + 5.25" 40/80 with psu	£209

Standard Monitors

Acorn Colour	**£199**
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Philips Mono (Green)	**£75**
Philips Mono (Amber)	**£79**

All monitors come with free lead. State type of computer when ordering.

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Please refer to Oak External SCSI prices on opposite page as prices for A3000 external units are the same.

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Serial Upgrade	£19
Serial Link Kit (BBC-Arc)	£14
User & Midi Podule	£46
VIDC Enhancer	£29

Master 128

Master 128	**£369**

Books (No Vat)

C: A Dabhand Guide	£14.95
Archimedes Assembly Language	£14.95
Archimedes Operating System	£14.95

The above books have accompanying discs add £5 for 5.25". £7 for 3.5"

Archimedes First Steps	£9.95
BASIC V: A Dabhand Guide	£9.95
RISCOS PRM's	£79.00
Acorn DTP Advanced U.G.	£14.95
BBC Basic Guide (Acorn)	£19.95
Master 128 Ref. Man.Pts 1&2 .. (ea.)	£14.95
A3000 Technical Guide	£29.95
A540 Technical Guide	£29.95
New Advanced User Guide	£19.95

Additional Arc Software Manuals (Acornsoft)

First Word Plus, DTP, Assembler . (ea.)	£10
ANSI C Version 3	£19

A3000 DTP Pack

Acorn A3000 upgraded to 2 Mb of memory complete with:-

Pro Artisan
Impression & Scanlight Junior
Oak monitor stand
Acorn Colour Monitor
RISC OS Extras & Utils Discs
Box of discs, printer cable, Font FX and mouse mat

A3000/2 DTP Pack	**£1299**

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EIZO 9060SZ Flexiscan	**£449**
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Taxan 770+ LR Multivision	**£425**
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Taxan Viking II Mode 23	**£799**

ˆ comes with free VIDC enhancer.

** monitor has 0.26 dot pitch and Sony Trinitron tube.

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Citizen 120D+ (Serial add £20)	£129
Citizen Swift 9	£179
Star LC10	£139
NEW - STAR LC200 COLOUR (9 pin)	£199
NEW - CANON Bubblejet BJ-10e	£289
Canon Bubblejet BJ-130e	£449
Citizen Swift 24	£249
Colour Kit for above (also Swift 9)	£39
NEW - STAR LC24 - 200	£239
NEW - STAR LC24 - 200 COLOUR	£289
Integrex Colourjet 132	£519
HP Paintjet	£795
LASER DIRECT (Qume)	£899
LASER DIRECT (LPB8 Hi Res.)	£1299

Midnight Tracer

New package from Midnight Graphics enabling you to convert Sprite files into fully scalable and editable object orientated Draw files. Tracer will automatically or manually convert monochrome sprites into Draw files, colour sprites can be manually traced or converted into monochrome allowing the auto tracing feature to be used.

Tracer	**£52.13**

Software

ANSI C V.3 Compiler + free C Guide	£139.95
Apocolypse (3D Space Game)	£24.95
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ArcComm (BBC Soft)	£24.95
ArcTerm (Serial Port)	£59.00
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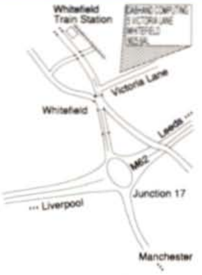

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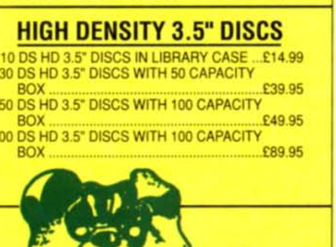

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Home and dry in Hampstead

RECENT correspondence has made it clear that many readers are still puzzled by various points in *Hampstead*, so I am going to give a brief – but complete – solution to the moves required in the game. You will still need to do some mapping though.

You start in the house: Search the lounge and the kitchen. This should unearth the UB40 and the key. Now go to the bedroom and take and wear the tracksuit – failure to do this will have you nicked for streaking the moment you go outside.

Take the bike and clips from the shed, and you can now drop the key. Wear the clips and you can then leave the area of the house by going east.

Proceed to the Dole Office and join the queue to receive your Giro cheque and then take it to the Post Office and cash it. Now take the notes and go north twice from the High Street into the middle of the trading estate.

Move E, E, NE, E, E, NE and N, take the bracket and then go SW and S to leave the estate. From here go to the wood west of Hampstead and then north to the bench where you should sit.

Take the credit card you'll now see, and go down the Main Road to the Oxfam shop where you will find the tweeds, which you should take and wear. Next go to the newsagents and search for the magazine. Now you can enter the station and buy a ticket.

Proceed SE to Waterloo and board the train. Take the card offered to you and read it. Give the man the bracket then take and wear the tie. Go North from the station and board the bus.

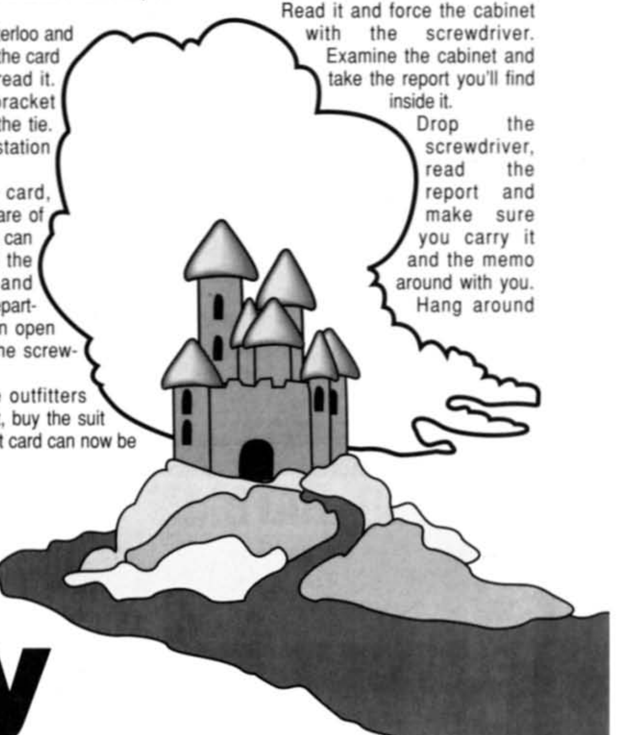
At Waterloo the card, pass and magazine are of no further use, so you can discard them. Go to the department store and locate the furniture department so that you can open the desk and take the screwdriver.

Now move to the outfitters east of Regent Street, buy the suit and wear it. The credit card can now be discarded and you should proceed to the club. In response to the question, enter Justin Perrier and then Yes.

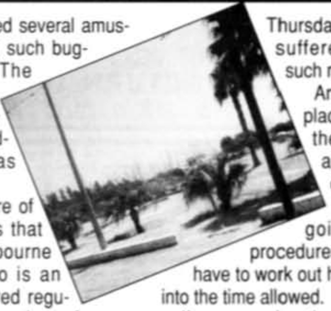
Take the letter and go east along Oxford Street to the merchant bank. Go up, then east to Sir Lionel's office and then West to your own office.

Examine the desk and take the memo: Read it and force the cabinet with the screwdriver. Examine the cabinet and take the report you'll find inside it.

Drop the screwdriver, read the report and make sure you carry it and the memo around with you. Hang around



Terrormolinos

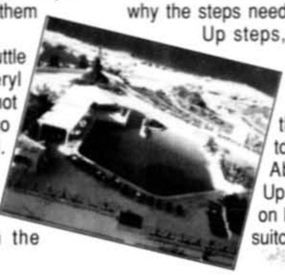


Melbourne House produced several amusing adventures, including such bug-infested classics as The Hobbit and Lord of the Rings. But one adventure that seemed less bug-ridden than most was Terrormolinos.

It had the typical mixture of wry humour and puzzles that characterised most Melbourne House offerings. It also is an adventure that has featured regularly in my postbag, as readers of this column have asked for help at various points in the game.

Your ultimate task is to collect 10 of those ghastly holiday photographs that people love to show their enemies – and they inevitably argue for ages as to whether a particular – and usually totally boring – shot was taken on a Wednesday or Thursday. I'm sure we've all suffered at the hands of such moronic monsters.

Anyway, in the starting place is in your home – the hall to be exact – and there is a move-counter working against you. I'm going to describe the procedures involved, but you'll have to work out how to fit them into the time allowed.



If you examine the coal scuttle there, you'll put your wife Beryl out for the count since she's not all that partial to spiders, so go east into the lounge instead. Examining the settee will produce the passport. Then having collected it, return to the hall and go north through the to the back yard.

Examine is a word that is needed a lot in Melbourne House adventures, and doing this to the washing line will yield up a pair of trunks. Take them and the steps. These *must* be scrutinised because otherwise you'll fail see the locking device – with fatal results when you try to use the steps.

Lock the steps and go back south into the kitchen and give the shelf there a once over. The camera is out of reach – which is why the steps need to be rendered safe: Up steps, take camera, down steps and it's time for further exploration.

South gets you into the hall and up to the top of the stairs you go. Above you is a hatch: Up steps, open hatch, up, on light, will show you the suitcase, harpoon gun and

nd then go to the boardroom where
uld enter OPTION 3.
take the draft and go south and
the motto – as often as you like –
oing to the estate agent. Examine
lay and buy the cottage.
u go to Covent Garden to the cook-
y and Take Pippa – again, if your
re full, do it as often as you like to
your score! Next find your way out
pa and go to the basement garage.
the car and go to the mansion.
car and pull the bell. When ques-
nter MEET CHUBBY and go South.
ou encounter Chubby he expects
t MARRY DAUGHTER and then
ld give him the memo and report.
, go north and take the car again.
and W to your district of origin and
S three times to the south end of
road.
the car here and go back into the
hop. Replace the tie and suit with
ksuit then go east and wear the
l take the bike. Last of all go to the
st of Hampstead and go east.
ou next month. Until then, happy
ing.

blem Corner

es Carl Berry deal with that
apdoor in **Waxwork?**

Mad Hatter
es up with the
t sharp answer
is classic
nture

ake these and go down the steps

north into your bedroom and
brochure. Reading it produces

information about your
resort – Terrormolinos
– and your tickets will
also flutter out of the
brochure to the
ground. Take them
and the letter,
which you need to
read in order to
discover which
hotel you are
staying at. Finally examine
essing table: You'll discover a
wer. Open it and remove the
ief you find there. You won't
blow your nose, but it can save

(*More next month*)

Hatter's Helpline

My mailbag continues to bulge with your comments and questions – and I'm not complaining – but please exercise monumental patience. The Hatter promise still holds good: You *will* get an answer eventually if you have enclosed a stamped addressed envelope. Other queries get into the column as space permits.

Matthew Bloch heads a helpful foursome who have added extra hints to the early stages of **Hitch-Hiker's Guide to the Galaxy.** I still haven't seen this game, so I am grateful for all tips received.

It is only available, so far as I know, on PC format, which means you need a Master 512 or BBC A3000/Archimedes with an emulator. Anyway their help follows.

After solving the babel-fish puzzle in the Vogon Hold, wait until you are strapped in the poetry-appreciation chair. Once the captain has begun, enter Enjoy Poetry.

The captain will now continue reading after the first verse is completed. Note down the first word of verse two – which is BLEEM. Once the reading is over, the guards will grab you. Before you are thrust into the airlock enter BLEEM.

This word should open the glass case and you'll have enough time to take the atomic vector plotter before you finally are put into the airlock.

Hitch-hike as normal, then when you emerge from the darkness and locate the bridge, drop everything except the atomic vector plotter. Now go to the engine room and look twice.

Take the spare improbability drive, leave the engine room and collect the cup of tea from the drinks dispenser. Next go back to the bridge and enter the following: Put long dangly bit (shades of *Bread*) into cup.

Then: Connect small plug to plotter and Connect large plug to large receptacle. Before you rush ahead and activate the improbability drive save your position. This is because you may well finish up in the wrong place.

Keep activating the drive until you arrive at a party in Islington as Trisha McMillan. Thanks lads.

Final comment from Matthew: *If anyone can help me with the Ravenous BugBlatter Beast of* Traal, please tell me. So, dear readers, it's over to you once again.

I have had a helpful letter from Carl Berry detailing his problems in a number of adventures. My help is limited because the solutions I possess – sent in by readers – don't make some things quite clear: So if I get bits wrong, could one of you please let me know.

He can't get anywhere much in **Eye of Zoltan** – though he hasn't done too badly in my view. Stuck at the end of the canyon, he can't unlock the door: Go Cavern is all the information I have there.

He's having trouble with the tiger on the island – and, again, the only comment I have at that location is: Drop beans, Drop water. The beans can be found in the Castle Kitchen, and the map I have seems to imply that Say Password at the Castle Wall will gain you entry.

Carl also has a problem with the Knight in **Five Stones of Anadon**. There is some armour to be found in a cave at the top and I have a feeling that the dragon is sorted out by breaking some eggs.

Mind you, Carl says that when he tries to hit the knight, he disappears, and I can't find any hint in the solution I've got to suggest why.

I've just read a cry for help from G. Koefod of Whitley Bay who is having problems with the Level 9 /Mandarin adventure **Lancelot** a superb adventure with an advanced parser and pictures for expanded BBC Micros and with fiendish puzzles as well.

He – or maybe she – has two problems: Getting knights to do his bidding and sorting out Turquin's Manor. I'm sure many folk have had problems like this, so detailed help follows thanks to Pete Austin himself.

First the business of getting people to co-operate. The needful input is: KNIGHT, (or name) COMMAND. Thus: *Knight,follow me* should work. Two things, though: Notice the comma after knight and also that there is no space.

However, there is random non-comprehension built into the parser, which means that sometimes you have to repeat the request – and if luck is against you it can be several repeats that are needed.

The Red Knight will certainly cut the briars – but he needs asking six times to achieve a breakthrough and if you allow for the odd refusal you can be into double figures before you succeed.

Now for the manor and the input required, assuming you have Sir Gawain with you:

Gawain, wait,hold panel. Stand on planks. In. Examine crossbow. (Red) Knight,wait for horn,wait 5. Out. North. No. North. North. Gawain,pull lever,turn winch,wait for horn,turn winch. Get in cage.Look.Ector,freeEctor,Agravain, Aliduke,Brandiles – and so on.

In the above paragraph the full stops indicate where you should hit Return,and remember: No spaces after the commas.

Checking up Checksums

Steve Turnbull unravels their innermost secrets

Get it right!

IT'S amazing how even copying one character differently from a listing in The Micro User can make the program fail. So to help you ensure that you have entered programs exactly as we printed them, with each there is a list of checksums called Get it Right!

The idea is simple: Enter the listing, call the checksum generator, check the numbers displayed against the ones printed in the magazine and, if they don't match, correct your listing and check it again.

The listings given with this article produces short machine code programs that generate checksums. Listing I is for the 8 bit BBC Micro and can stay resident in your micro to be called when you need it. Listing II – written by Paul Dellar – is for the Archimedes series and can be called from disc whenever it's required.

So type in the appropriate listing, taking care not to make any typing errors – unfortunately you haven't got Get it Right! yet. Save the routine and run it and the code created and saved is the new checksum generating program.

The 8 bit version is run from disc just by typing:

```
*xs
```

After this you can call it again with:

```
CALL&B00
```

No disc access is needed. Tape users should load it using:

```
*LOAD xs B00
```

It is then run by entering:

```
CALL &B00
```

On the Archimedes series, the saved code is loaded and run by typing:

```
*CHECK
```

To produce a printout of the checksums, enter Control+B before pressing the Return after *xs, *CHECK or the CALL. If you want the automatic paging facility use Control+N and to switch these off afterwards use Control+C and Control+O respectively.

If you are using the 6502 second or co-processor you should alter the program to run at &F600, by changing line 100 to read:

```
100 byte=&FFF4:code=&F600
```

It is used in just the same way. To call it after the first run use:

```
CALL&F600
```

So now you should be able to enter the listings published in The Micro User and be certain that you've typed them exactly as we've printed them.

Listing I

```
 10 REM Basic Checksum
 20 REM by Steve Turnbull
 30 REM (c) The Micro User
 40 MODE7:PROCinit
 50 PROCdeclare:PROCassemble
 60 PROCcli("SAVE xs "+STR$~code+"+200")
 70 END
 80 DEF PROCinit
 90 newl=&FFE7:wrch=&FFEE
100 byte=&FFF4:code=&B00
110 rem=&F4:data=&DC
120 return=&0D:spc=32
130 qts=ASC"""":colon=ASC":"
140 comma=ASC",":Lbrk=ASC"["
150 rbrk=ASC"]":mcom=ASC"\"
160 escflg=&FF:ENDPROC
170 DEF PROCdeclare
180 P%=&60:L%=2:[OPT L%
190 .Lcrc OPT FNw:.ocrc OPT FNw
200 .wcrc OPT FNw:.Lptr OPT FNw
210 .Lnum OPT FNw:.LLen OPT FNb
220 .Ltmp OPT FNb:.zflg OPT FNb
230 .Lend OPT FNb:.qflg OPT FNb
240 .LoNum OPT FNb:.HiNum OPT FNb
250 .LoWork OPT FNb:.HiWrk OPT FNb
260 .txtptr OPT FNw:.NmBase OPT FNb
270 .crcptr OPT FNw:.codeflg OPT FNb
280 .dataflg OPT FNb:.savebyt OPT FNb
290 .FldSize OPT FNb:]:ENDPROC
300 DEF FNb:P%=P%+1:=L%
310 DEF FNw:P%=P%+2:=L%
320 DEF PROCassemble
330 FOR L%=0 TO 2 STEP 2
340 P%=code:[OPT L%
350 .check:LDA #0:STA codeflg
360  STA ocrc:STA ocrc+1
370  LDA #131:JSR byte
380  STX Lptr:STY Lptr+1
390 .start:JSR newl
400 .while:BIT escflg:BMI escape
410  LDY #1:LDA (Lptr),Y:BPL doline
420 .wayout:RTS
430 .escape:BRK:BRK
440  EQUS "Escape":BRK
450 .bad:BRK:BRK
460  EQUS "Bad program":BRK
470 .doline:LDA #0:STA Lcrc:STA Lcrc+1
480  STA qflg:STA dataflg
490  TAY:LDA (Lptr),Y:CMP #&0D:BNE bad
500  INY:LDA (Lptr),Y:STA Lnum+1
510  INY:LDA (Lptr),Y:STA Lnum
520  INY:LDA (Lptr),Y:STA Lend
530  JSR prescan:CPY #5
540  BCC display:LDY #4
550 .skipspc:LDA (Lptr),Y
560  CMP #spc:BNE scan:INY:CPY LLen
570  BEQ display:BNE skipspc
580 .scan:LDA (Lptr),Y:JSR dobyte
590  INY:CPY LLen:BCC scan
600 .display:LDX Lnum:LDY Lnum+1
610  JSR pdec:LDA #spc:JSR wrch
620  LDA #ASC"=":JSR wrch:LDA #spc
630  JSR wrch:LDX Lcrc:LDY Lcrc+1
640  JSR phex:LDA ocrc:JSR lastchk
650  LDY LLen:CPY Lend:BEQ newline
660  LDA #ASC"*":JSR wrch
670 .newline:JSR newl
680 .update:CLC:LDA Lptr:ADC Lend
690  STA Lptr:BCC unwhile:INC Lptr+1
700 .unwhile:JMP while
710 .prescan:LDY Lend
720 .psLoop:DEY:LDA (Lptr),Y
730  CMP #spc:BEQ psLoop:INY
740  STY LLen:RTS
750 .dobyte:STA savebyt:CMP #qts
760  BNE notqe:PHA:LDA qflg
770  EOR #&FF:STA qflg:PLA
780 .notqe:BIT qflg:BMI skpcode
790  BIT codeflg:BMI jcode
```

on your

Step–by–step guide to using checksums

Let's assume you've decided to type in a game from The Micro User. You've switched on your micro and the appropriate magazine is open beside it:

- Type in about 10 lines of the program. Note that for clarity we use LISTO 1 to display spaces between the line number and the actual line. You should not enter these as they waste memory.

- Next run whichever version of the checksum program you are using to produce the checksums for these first lines.

- A checksum consists of up to four hexadecimal digits in a group followed by a space and then a single digit called the cumulative digit.

- Compare the cumulative digit of the last line displayed with the equivalent digit in the checksum list printed in the magazine.

- If they are the same you know that you have made no errors so far, and you can safely type in the next few lines and repeat the check for these.

- When there is a difference in the cumulative digits, find the first one which differs. Either that line or the one before will contain a discrepancy between the magazine and what you have typed – the odd line out can be identified because the group of four digits listed by the program will be different to those in the magazine.

  Common errors to watch out for are: Confusions between a lower case L and the digit one, digit zero and capital O, or incorrect numbers of spaces between quotes and so on.

- Once you have found and corrected the difference you should do the checksums for that group of lines again so you can spot any other differences.

- Just keep repeating the enter, checksum and correction sequence until you've typed in the whole program, which will then run correctly first time.

Once you have become familiar and confident with the technique you can type in bigger chunks of the program before checking. In time you will be able to type in the whole program before using the checksums – but the checking method remains the same.

In the stars

Sometimes you will find an asterisk at the end of a checksum. This means that you've added one or more unnecessary spaces to the end of the line.

The space between the line number and the actual line doesn't affect the checksum, but it should be omitted to conserve memory.

Tape users

Save the program xs as described then to use it:

```
*Load xs 800
CALL &800
```

All other instructions are the same as for disc users.

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```
800  JSR basic:JMP skpcode
810 .jcode:JSR mcode
820 .skpcode:LDA savebyt:CPY LLen
830  BEQ skipcrc:STY Ltmp:LDX Lcrc
840  LDY Lcrc+1:JSR docrc:STX Lcrc
850  STY Lcrc+1:LDX ocrc:LDY ocrc+1
860  JSR docrc:STX ocrc:STY ocrc+1
870  LDY Ltmp
880 .skipcrc:RTS
890 .basic:CMP #rem:BEQ skpline
900  CMP #data:BNE skpdata:DEC dataflg
910 .skpdata:BIT dataflg:BMI xbasic
920  CMP #Lbrk:BNE xbasic:LDA #&FF
930  STA codeflg:RTS
940 .skpline:LDY LLen
950 .xbasic:RTS
960 .mcode:CMP #mcom:BEQ skipcom
970  CMP #rbrk:BNE xmcode
980  LDA #0:STA codeflg
990 .xmcode:RTS
1000 .skipcom:LDA qflg:PHA
1010  LDA #0:STA qflg
1020 .skpLoop:INY:LDA (Lptr),Y
1030  CMP #qts:BNE skpchk:PHA
1040  LDA qflg:EOR #&FF:STA qflg:PLA
1050 .skpchk:CPY LLen:BEQ skpexit
1060  CMP #colon:BNE skpLoop:BIT qflg
1070  BMI skpLoop
1080 .skpexit:PLA:STA qflg
1090  LDA (Lptr),Y:STA savebyt:RTS
1100 .docrc:PHA:STX wcrc:STY wcrc+1
1110  EOR wcrc+1:STA wcrc+1:LDX #7
1120 .crclp:BIT wcrc+1:CLC:BPL crcskp
1130  LDA wcrc:EOR #&10:STA wcrc
1140  LDA wcrc+1:EOR #&08:STA wcrc+1
1150  SEC
1160 .crcskp:ROL wcrc:ROL wcrc+1:DEX
1170  BPL crclp:LDX wcrc:LDY wcrc+1
1180  PLA:RTS
1190 .lastchk:PHA:LDA #spc:JSR wrch
1200  PLA:AND #&0F:TAX:LDA #&FF
1210  PHA:TXA:JMP notz
1220 .pdec:LDA #10:BNE pnum
1230 .phex:LDA #16
1240 .pnum:STX LoNum:STY HiNum
1250  STA NmBase:LDA #4:STA FldSize
1260  LDA #255:STA zflg
1270 .nbit:PHA:LDA #0:STA LoWork
1280  STA HiWrk:LDX #16
1290 .next:ASL LoNum:ROL HiNum
1300  ROL LoWork:ROL HiWrk:LDA LoWork
1310  SEC:SBC NmBase:TAY:LDA HiWrk
1320  SBC #0:BCC done:INC LoNum
1330  STY LoWork:STA HiWrk
1340 .done:DEX:BNE next:LDA LoWork
1350  DEC FldSize:BNE nbit
1360 .out:TAX:BNE notz:PLA:PHA:PHP
1370  TXA:PLP:BMI notz:BIT zflg
1380  BPL notz:LDA #spc:BNE digout
1390 .notz:LDX #0:STX zflg:CMP #10
1400  BCC add:ADC #6
1410 .add:ADC #48
1420 .digout:JSR wrch:PLA:BPL out
1430 .exit:RTS
1440 ]:NEXT:ENDPROC
1450 DEF PROCcli($&700):LOCALX%,Y%
1460 Y%=7:CALL&FFF7:ENDPROC
```

➤

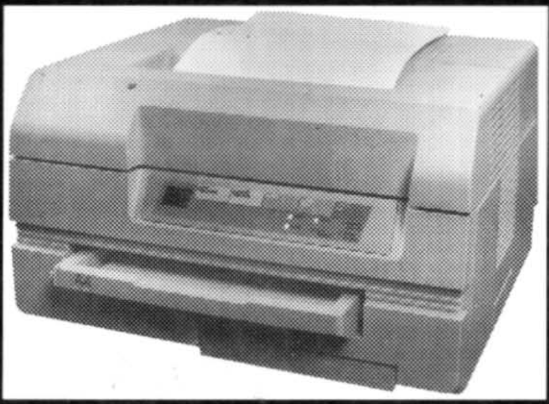
Get it right!

➤

Listing II

```
   10 REM >$.Check/Src
   20 REM by Paul Dellar
   30 REM (c) The Micro User
   40 DIM code% &1000
   50 PROCassemble
   60 OSCLI("SAVE Check "+STR$~code%+" "
+STR$~0%)
   70 OSCLI("SETTYPE Check FFC"):END
   90 :
  100 DEF PROCassemble
  110 work_crc = 0:char      = 1
  120 loop     = 2:mask      = 3
  130 flags    = 4:total_crc= 5
  140 line_crc = 6:start     = 8
  150 end      = 9:line_len =10
  160 line_num =11:prog_ptr =12
  170 sp       =13:link      =14
  180 WriteI   =&100
  190 rem_token=&F4:data_token=&DC
  200 quoteflag=1<<30
  210 comntflag=1<<29
  220 data_flag=1<<28
  230 fieldlen =5:maxlen   =8
  240 FOR pass%=4 TO 7 STEP 2
  250 P%=0:O%=code%:[OPT pass%
  260 .checksum
  270         STMFD (sp)!,{link}
  280         MOV   prog_ptr,#&8F00
  290         MOV   total_crc,#0
  300         MOV   flags,#0
  310 .for_each_line
  320         SWI   "OS_ReadEscapeState"
  330         BCS   exit
  340         BIC   flags,flags,#data_flag
  350         BIC   flags,flags,#comntflag
  360         BIC   flags,flags,#quoteflag
  370         LDRB  char,[prog_ptr,#1]
  380         CMP   char,#&7F
  390         BGT   exit
  400         MOV   line_crc,#0
  410         LDRB  char,[prog_ptr]
  420         CMP   char,#&0D
  430         BNE   bad_prog
  440         LDRB  line_num,[prog_ptr,#1]
  450         MOV   line_num,line_num,LSL#
8
  460         LDRB  char,[prog_ptr,#2]
  470         ADD   line_num,line_num,char
  480         LDRB  line_len,[prog_ptr,#3]
  490         MOV   start,#4
  500         MOV   end,line_len
  510 .trailing_spaces
  520         CMP   end,start
  530         BEQ   leading_spaces
  540         LDRB  char,[prog_ptr,end]
  550         CMP   char,#ASC" "
  560         SUBEQ end,end,#1
  570         BEQ   trailing_spaces
  580 .leading_spaces
  590         CMP   start,end
  600         BEQ   check_loop
  610         LDRB  char,[prog_ptr,start]
  620         CMP   char,#ASC" "
  630         ADDEQ start,start,#1
  640         BEQ   leading_spaces
  650 .check_loop
  660         LDRB  char,[prog_ptr,start]
  670         CMP   char,#rem_token
  680         BEQ   no_crc
  690         CMP   char,#data_token
  700         ORREQ flags,flags,#data_flag
  710         TST   flags,#data_flag
  720         BNE   no_further_checks
  730         CMP   char,#ASC(":")
  740         BICEQ flags,flags,#comntflag
  750         TST   flags,#comntflag
  760         BNE   next_byte
  770         CMP   char,#ASC("""")
  780         EOREQ flags,flags,#quoteflag
  790         TST   flags,#quoteflag
  800         BNE   no_further_checks
  810         CMP   char,#ASC("[")
  820         ADDEQ flags,flags,#1
  830         ANDS  flags,flags,#255
  840         BEQ   no_further_checks
  850         CMP   char,#ASC("\")
  860         ORREQ flags,flags,#comntflag
  870         TST   flags,#comntflag
  880         BNE   next_byte
  890         CMP   char,#ASC("]")
  900         SUBEQ flags,flags,#1
  910 .no_further_checks
  920         MOV   work_crc,line_crc
  930         BL    crc_code
  940         MOV   line_crc,work_crc
  950         MOV   work_crc,total_crc
  960         BL    crc_code
  970         MOV   total_crc,work_crc
  980 .next_byte
  990         ADD   start,start,#1
 1000         CMP   start,end
 1010         BLT   check_loop
 1020 .no_crc
 1030         MOV   R0,#ASC(" ")
 1040         MOV   loop,#8
 1050         ADR   R1,print_buff
 1060 .clear_lp
 1070         STRB  R0,[R1,loop]
 1080         SUBS  loop,loop,#1
 1090         BGT   clear_lp
 1100         MOV   R0,line_num
 1110         MOV   R2,#maxlen
 1120         SWI   "OS_BinaryToDecimal"
 1130         MOV   R0,R1
 1140         MOV   R1,R2
 1150         RSBS  R3,R1,#fieldlen
 1160         BLNE  printSpaces
 1170         SWI   "OS_WriteN"
 1180         SWI   WriteI+ASC(" ")
 1190         SWI   WriteI+ASC("=")
 1200         SWI   WriteI+ASC(" ")
 1210         MOV   R0,line_crc
 1220         ADR   R1,print_buff
 1230         MOV   R2,#maxlen
 1240         SWI   "OS_ConvertHex4"
 1250         MOV   R1,#4
 1260         BL    leadingSpaces
 1270         SWI   "OS_WriteN"
 1280         SWI   WriteI+ASC(" ")
 1290         MOV   R0,total_crc
 1300         ADR   R1,print_buff
 1310         MOV   R2,#maxlen
 1320         SWI   "OS_ConvertHex1"
 1330         MOV   R1,#1
 1340         SWI   "OS_WriteN"
 1350         CMP   end,line_len
 1360         SWINE WriteI+ASC("*")
 1370         SWI   "OS_NewLine"
 1380         ADD   prog_ptr,prog_ptr,line
_len
 1390         LDRB  char,[prog_ptr,#1]
 1400         CMP   char,#&7F
 1410         BLE   for_each_line
 1420 .exit
 1430         LDMFD (sp)!,{pc}
 1440 .bad_prog
 1450         SWI   "OS_WriteS"
 1460         EQUS  "Bad Program"
 1470         EQUW  13
 1480         ALIGN
 1490         LDMFD (sp)!,{pc}
 1500 .crc_code
 1510         MOV   mask,#&FF
 1520         ADD   mask,mask,#&FF00
 1530         EOR   work_crc,work_crc,char
,LSL#8
 1540         MOV   loop,#7
 1550 .crc_loop
 1560         TST   work_crc,#1<<15
 1570         EORNE work_crc,work_crc,#&81
0
 1580         MOV   work_crc,work_crc,LSL
#1
 1590         ADDNE work_crc,work_crc,#1
 1600         AND   work_crc,work_crc,mask
 1610         SUBS  loop,loop,#1
 1620         BPL   crc_loop
 1630         MOV   pc,link
 1640 .printSpaces
 1650         STMFD (sp)!,{R0-R2,link}
 1660         ADR   R0,spaces
 1670         MOV   R1,R3
 1680         SWI   "OS_WriteN"
 1690         LDMFD (sp)!,{R0-R2,pc}
 1700 .leadingSpaces
 1710         STMFD (sp)!,{R0-R2,link}
 1720         MOV   R1,#0
 1730 .spacesLoop
 1740         LDRB  R2,[R0,R1]
 1750         CMP   R2,#ASC("0")
 1760         BNE   spacesExit
 1770         MOVEQ R2,#32
 1780         STREQB R2,[R0,R1]
 1790         ADD   R1,R1,#1
 1800         CMP   R1,#3
 1810         BNE   spacesLoop
 1820 .spacesExit
 1830         LDMFD (sp)!,{R0-R2,pc}
 1840 .print_buff
 1850         EQUS  STRING$(maxlen," ")
 1860 .spaces
 1870         EQUS  STRING$(fieldlen," ")
 1880 ]:NEXT:ENDPROC
```

ARCLASER



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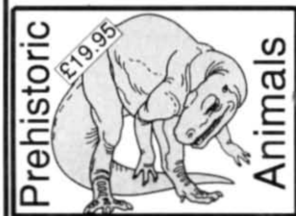

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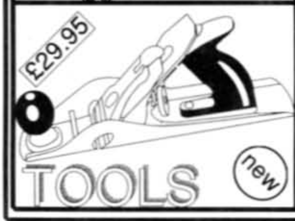

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Access

New boy makes a big impression

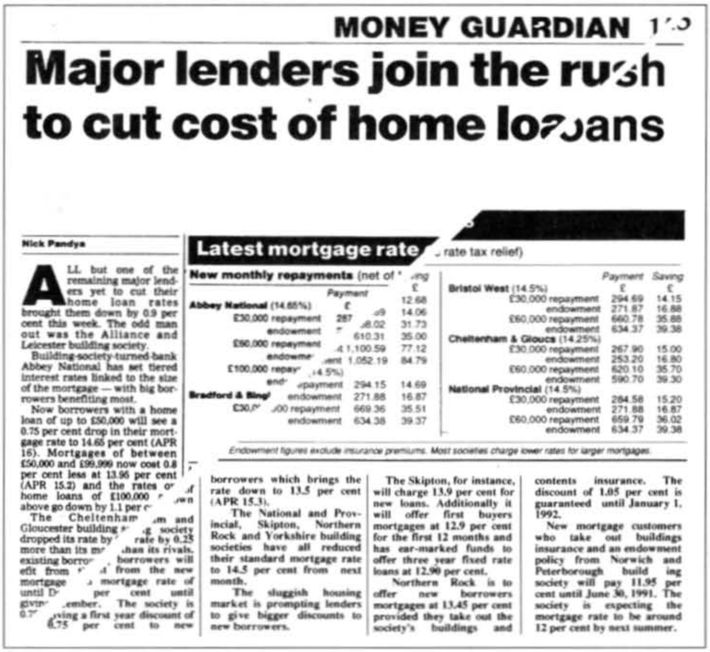
Jim Pascoe investigates Impression's younger sibling

COMPUTER CONCEPTS have a long-standing pedigree when it comes to word processors on the BBC Micro. Their debut on the Archimedes scene with Impression has been equally noteworthy. Now a simpler version has been launched aimed at the school market – Impression Junior.

Having used Junior on a 2Mb A3000, the most surprising thing about it is it's similarity to its big brother. If you are familiar with the strange protective device, the dongle accompanying Impression, you'll breathe a sigh of relief that you don't have to use one with this package. In fact there is no problem at all in making backup copies, unlike Beebug's Ovation, which only allows two.

It was nice to find that the main menu had a manageable six choices, grouped under sensible and obvious headings like Ruler and Frame. It is sometimes difficult to think of a meaningful name to cover fonts and type, but the label Effect is a good solution.

Product: Impression Junior
Price: £89.95
Supplier: Computer Concepts, Gaddeson Place, Hemel Hempstead, Hertfordshire HP2 6EX.
Tel: 0442 63933
Requirements: BBC A3000 and Archimedes range



MONEY GUARDIAN 1'.ɔ

Major lenders join the ruʒh to cut cost of home lo?ɔans

Nick Pandya

ALL but one of the remaining major lenders yet to cut their home loan rates brought them down by 0.9 per cent this week. The odd man out was the Alliance and Leicester building society.

Building-society-turned-bank Abbey National has set tiered interest rates linked to the size of the mortgage — with big borrowers benefiting most.

Now borrowers with a home loan of up to £50,000 will see a 0.75 per cent drop in their mortgage rate to 14.65 per cent (APR 16). Mortgages of between £50,000 and £99,999 now cost 0.8 per cent less at 13.95 per cent (APR 15.2) and the rates o' ..f home loans of £100,000 ' ..wn above go down by 1.1 per c'

The Cheltenham' ..m and Gloucester building ' ..g society dropped its rate by ' rate by 0.25 more than its m' ..han its rivals. existing borro' , borrowers will efit from ' ..d from the new mortgage ..a mortgage rate of until D' per cent until givin' ..ember. The society is 0.7' ..ving a first year discount of 0.75 per cent to new borrowers which brings the rate down to 13.5 per cent (APR 15.3).

The National and Provincial, Skipton, Northern Rock and Yorkshire building societies have all reduced their standard mortgage rate to 14.5 per cent from next month.

The sluggish housing market is prompting lenders to give bigger discounts to new borrowers.

The Skipton, for instance, will charge 13.9 per cent for new loans. Additionally it will offer first buyers mortgages at 12.9 per cent for the first 12 months and has ear-marked funds to offer three year fixed rate loans at 12.90 per cent.

Northern Rock is to offer new borrowers mortgages at 13.45 per cent provided they take out the society's buildings and contents insurance. The discount of 1.05 per cent is guaranteed until January 1, 1992.

New mortgage customers who take out buildings insurance and an endowment policy from Norwich and Peterborough build ing society will pay 11.95 per cent until June 30, 1991. The society is expecting the mortgage rate to be around 12 per cent by next summer.

Latest mortgage rate ..s

New monthly repayments (net of ' ..rate tax relief)

	Payment	..ving
Abbey National (14.65%)	£	£
		12.68
£30,000 repayment	287 ..9	14.06
endowment	" ..8.02	31.73
	610.31	35.00
£60,000 repayment	..4 1,100.59	77.12
endowme' ..ent	1,052.19	84.79
£100,000 repay' ..4.5%)		
end' ..epayment	294.15	14.69
Bradford & Bingl endowment	271.88	16.87
£30,0' ..00 repayment	669.36	35.51
endowment	634.38	39.37

	Payment	Saving
Bristol West (14.5%)	£	£
£30,000 repayment	294.69	14.15
endowment	271.87	16.88
£60,000 repayment	660.78	35.88
endowment	634.37	39.38
Cheltenham & Gloucs (14.25%)		
£30,000 repayment	267.90	15.00
endowment	253.20	16.80
£60,000 repayment	620.10	35.70
endowment	590.70	39.30
National Provincial (14.5%)		
£30,000 repayment	284.58	15.20
endowment	271.88	16.87
£60,000 repayment	659.79	36.02
endowment	634.37	39.38

Endowment figures exclude insurance premiums. Most societies charge lower rates for larger mortgages.

Copying a newspaper

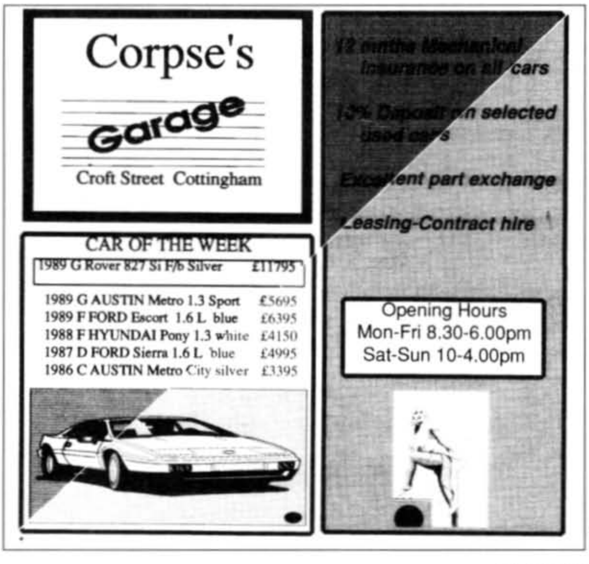
Clicking on the main icon gives you a blank page. Impression is a frame-based package and the initial document has one large frame. You can start typing straight away, as this setup will give you an A4 printout using the default font and style.

You need get no more involved if all you want is a word processor. If your work extends over one page another identical frame will appear automatically and you simply continue to type.

All the functions you'd expect are there: Centering, justifying, cut-and-paste and copying of text.

The possibilities

A quick perusal of the menus will give you an idea of the options available. There's a nice range of five fonts, but the manual doesn't include a display of sample text. Also anyone not used to printers' jargon is ➤



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1987 D FORD Sierra 1.6 L blue	£4995
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Dot matrix versus laser print

➤

unlikely to know whether they want 8 or 48 point type.

Help is at hand, as the manual is easier to follow than the original tome, and also enclosed is a very useful book by Rob Pickering: *DTP at a Glance.*

Page design is done by placing the rectangular frames where you want them. If you want all your text in one frame you can enlarge the frame or choose a smaller size of type. You can also have text in blocks/frames with one block leading to another – as on a three column page like this one.

Impression Junior provides two additional aids. By turning on the vertical and horizontal rulers you can position frames precisely.

A screen size can be selected which allows all the page to be shown onscreen, or it can be matched exactly to the page size you will be using.

Spell right

It now seems standard practice to include a spelling checker in a DTP package, and the one supplied is excellent. The Guess function is particularly good, and almost always plumped for the correct word.

Mine is turned on all the time, beeping when making an error is made. It's all the more surprising that in the sample documents supplied on disc, Impression Junior has two errors – one spelling and one grammatical. You can import text from other word processors if needed .

One of the strengths of DTP is that you can mix text with graphics. Unlike several other packages, Impression Junior allows you to put either text or graphics into frames on the same page. A good range of high standard clip art is supplied.

Importing a picture merely involves dragging the icon from a directory into the chosen frame. It is also easy to chop bits off a picture as required, or scale to fit if your frame is not quite in the right proportion.

Summing up

While the primary sector would probably benefit more from Folio or Front Page because of the number of learning hours required by Impression Junior, many secondary school pupils and staff could learn to use it at a fairly basic level. With a few enthusiasts to provide a resource for others to use it could develop its full potential.

Putting in borders can be fiddly – you'll find it easier if you study both book and manual before you start.

The manual is quite an improvement on the one used with Impression, offering clear explanations and diagrams, straightforward text and an excellent index.

Output

The moment of truth comes with the output – the standard of printing is good on a 9-pin dot matrix printer, a 24-pin or on an ink jet or laser printer.

A full DTP text printout is treated as a graphic and takes 15 minutes. So it is not realistic to use the package as a wordprocessor when there are many pages to print and a number of pupils want a printout. If every one had their own laser printer, then perhaps ...

The differences between the senior and junior versions are slight: You can rotate graphics to any angle in the senior version as well as using chapters for large documents and defining global styles.

For the price Impression Junior is certainly a powerful, easy to use and very competitive package of high quality. It's definitely not a baby starter package and has most of the impressive features of Impression 2.

Ace Computing

♠

RISC OS Euclid is the best multi-tasking 3D graphics and animation system for the Archimedes. It works like a 3D version of Draw, and now forms the centrepiece for a number of related products allowing the creation of complex animation sequences with the minimum of effort.

Mogul makes full use of **Euclid**'s unique hierarchical data structure to generate films of 3D objects with articulated motion and simultaneous camera motion.

Tween produces films from Draw files. It uses techniques similar to **Mogul** and generates a film by calculating intermediate frames from a set of key positions.

Splice allows you to edit films produced by **Mogul** or **Tween**. You can even produce hand-drawn cartoons by converting sprites from any source.

Support is provided for import and export of Sprites and Drawfiles. Films can be played by the **Projector** which comes free with **Euclid, Mogul, Splice and Tween**. Films and Euclid files can be used with Genesis.

Such is the enthusiasm for **Euclid** there is now a user group called **Elements** which provides a quarterly disk containing hints, tips, animations and user pictures like the ones in this advertisement.

Euclid £70 **Mogul** £20 **Splice** £30
Tween £30 **ArcLight** £50
Ace Computing, 27 Victoria Road,
Cambridge, CB4 3BW.
Tel: (0223) 322559
All prices include VAT and P&P.

♠

Ace Computing

UPDATE

Desktop Folio has arrived

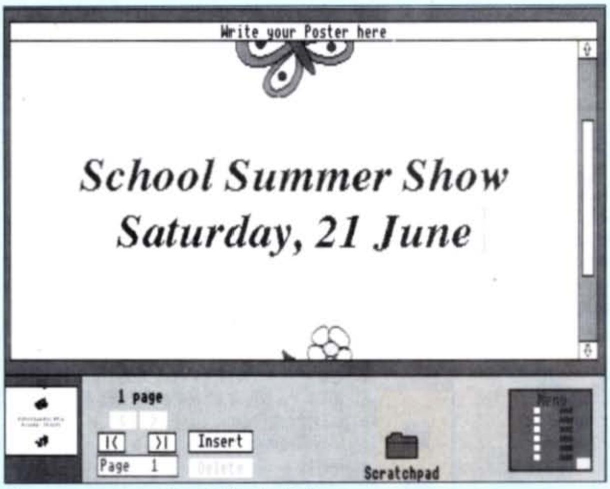
AT long last the wait is over. Desktop Folio is being officially launched for the Archimedes by ESM (0223 65445) on January 16.

The package, which takes the form of a wordprocessor, desktop and interactive publisher, has already attracted considerable interest from teachers and advisors throughout the UK.

Many have already attended pre-release demonstrations held by almost every local education authority.

Ysanne Heald, ESM's divisional director, told *The Micro User* : "Desktop Folio has been delayed to give us time to incorporate extra features requested by teachers".

The standalone package costs £90 with primary and secondary licences available at £250 and £375 respectively.



Write your Poster here

School Summer Show
Saturday, 21 June

Be your own poster printer with Desktop Folio

One hour data lesson

FOLLOWING a universal thumbs up from teachers throughout South London, a new database package geared to the needs of the "Baker generation" has been launched by Shenley Software (081-949 3235).

Written by Brian Durrant, senior advisory teacher for information technology at Kingston-upon-Thames, the program allows pupils to create a file, enter data, construct a range of charts and print them, all within a one hour session.

It incorporates three levels of operation allowing use in four key stages – from age five to 16.

Examples of use so far have included an examination of the miracles of Jesus, results of science experiments and an analysis of the characters of Macbeth.

DataKing is available for the BBC Micro and Archimedes at a cost of £49 for a standalone site licence.

TV programs backup

YORKSHIRE Television Enterprises (0532 438283) have released a number of software packages for the BBC and Master Series based on their popular educational TV programmes.

Four suites of programs are available, each designed to complement its TV counterpart.

How We Used To Live helps extend young people's knowledge of the social, historical and political climates of different periods.

Scientific Eye aims to develop scientific thinking, covering such subjects as epidemics and pollution, while Mathematical Eye is designed to help pupil's investigation and problem solving skills.

Viking England plots the progress of a Viking community as it plans a raid, chooses a sea route and landing site, moves inland and builds a new settlement.

All programs come with teacher's notes. Prices start from £22.95.

New Topologika range

A RANGE of new educational programs are now available from Topologika (0733 244682).

Tiny Logo/Tiny Draw for the BBC A3000 is a double package consisting of an icon/mouse controlled implementation of Logo and a drawing and painting program, price £26.04

Freddy Teddy aims to teach colour and size recognition by means of three programs, Colours, Sequence and Size, in which Freddy must be taught to undertake various tasks including baking cakes and packing sweets.

Soon to be released are Freddy's Adventure, in which children must solve simple simple puzzles to find the missing honey and The Playground, where the number of goes Freddy has on a swing, slide and roundabout can be controlled.

All three programs are available for the BBC A3000 priced £17.35.

Moving Squares allows squares on the Archimedes to be animated using translations, enlargements and rotations. "Essentially it enables you to become a film director, and teaches angles too", says Topologika's managing director, Brian Kerslake. Price £10.50

The Giant Killer Support Disc has been produced following requests from teachers for graphics to make the bestselling game more accessible.

It offers all of the more difficult puzzles in graphical form, so that students can meet them either before they play the game or when they get stuck.

Available for the BBC and Archimedes, the package costs £15.22.

More IT in music

THE Hybrid Music Systemhas been reorganised and expanded by Hybrid Technology to meet the needs of the widening use of IT in music education.

There are now 10 packages, ranging in price from £99 to £729. Four completely new ones are designed for the expanding Primary and Special Needs fields.

Each package provides all hardware and software needed for an existing BBC Micro or Master system, and can be upgraded by buying additional components separately.

The basic Primary system, which includes the Music 5000 Synthesiser and Universal software, allows existing standard classroom software to play with high quality instrument sounds and effects instead of the micro's standard beep.

Further packages extend the system's range to secondary pupils and also severely handicapped children.

All art's

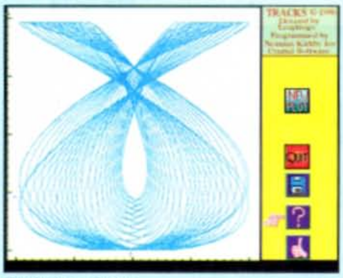
Steve Bruntlett takes two art packages by the horns

CONSISTING of software and a well illustrated, good quality tumble book running to 60 pages, each Art Machine pack contains resource material and ideas for follow up work in the home or classroom. There are some action pages which let you start working straight away.

The manual covers both packs and has two fronts so it can be read from either end. Each half covers one of the packages, so at least you can see what the other programs do if you cannot afford to buy both at the same time.

The first pack contains five programs from maths specialists Leapfrogs. The other has five programs seen at the exhibition developed from Central Television's Junior Maths and Videomaths series devised by Leapfrogs and programmed by GSN Software.

The first set have two modes of operation: Gallery mode, which shows a continuous display of images previously created and saved on disc, and Expert which, by clicking on the thumbs up icon allows you to produce your own images.

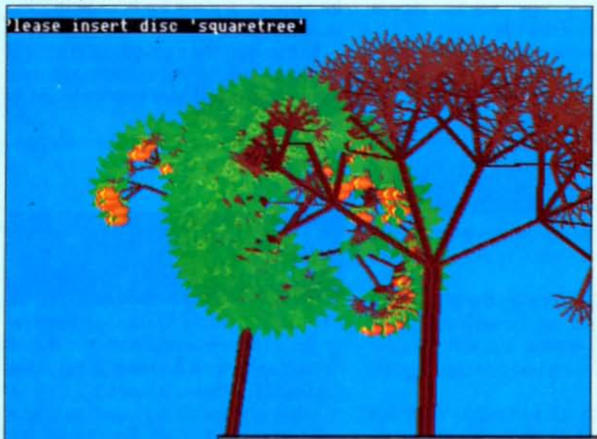

Tracks in operation

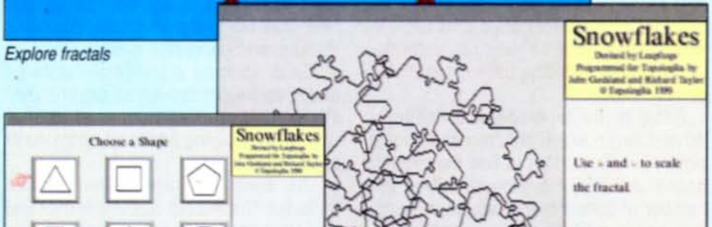
All the programs are extremely easy to use once you get used to using the thumb icons, and pictures can be saved to disc or printed out at any stage. The programs also feature comprehensive help screens – useful as there is no specific documentation.

There are instructions on how to load a printer driver on the Tracks instruction sheet in pack two, but this needs to be more prominent in both packages. The versions sent for review were pre-release, and although some alterations and improvements are promised I have no major complaints apart from not being able to exit a couple of them.

Having worked my way through all the programs over a couple of days I must say I enjoyed myself and see a lot of use for them in primary schools and there may be uses for some of the programs in the secondary sphere.

Patterned Tiles allows you to explore pattern making, using up to four two-coloured square tiles on a grid size you determine yourself. You select the colours to produce manual patterns by choosing tile and orientation, or automatic patterns by typing in a mathematical function. If you think that the patterns produced are a bit clinical you can insert a little chaos with another option.


lease insert disc 'squaretree'



Use + and - to scale the fractal.

Use the up and down icons to go forwards and backwards a stage.

Explore fractals

The basic Snowflake shapes

Snowflakes explores the world of fractals using one of nine basic snowflake shapes. I always thought that snowflakes were based on a hexagon, but the extra shapes allow you to explore fractals a lot more fully than by sticking to just one shape.

There are five stages of transformation with four basic shape changes and the size of the snowflake can be altered if smaller ones are required.

Cyclic Story, which features some wonderful artwork, allows the production of your own story cycles by selecting pre-drawn animation sequences from a whole screenful of graphics and editing them into a film. It can then be viewed or saved to disc.

The images and animation are centred on a theme of *Spaceship Earth* and feature squirrels, acorns, birds, a forest and the destruction of a house. The program could form the basis of a story-telling project.

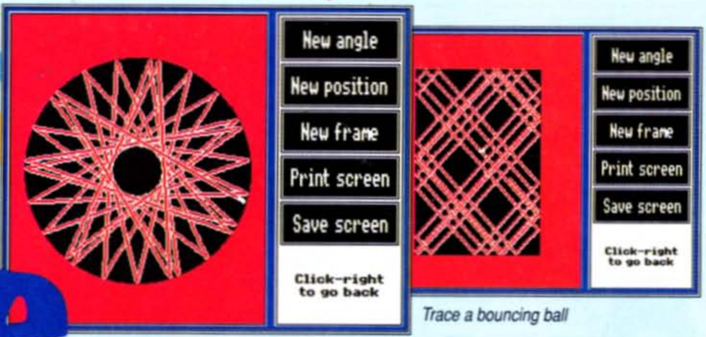
Sequences can be frozen and still images printed out at any stage, or they could be frozen while the story is related by a pupil to the rest of the class.

The images, contained in sprite files, can be loaded into a paint package and the individual still images printed out, worked on with paint tools or dropped into a DTP package for project work. Excellent.

Moving Squares allows you to become involved in animation using a square. This might not sound very exciting, but you have control over the size, colour and position of the square leading to the movements and transformations.

Sequences can be built up stage by stage and linked into longer sequences. Very straightforward to use, the help screens and the thumbs up/down system

for sake



Trace a bouncing ball

Product: The Art Machine I & II
Price: £25 each package (single programs £10.50 each)
Supplier: Topologika, PO Box 39, Stilton, Peterborough, PE7 3RL.
Tel: 0733 244682
Requirements: A3000 and Archimedes series

help you move through the program options.

A reasonable amount of time will be spent in producing animations, but individual efforts can be linked together as a class animation. The fascinating demonstration films of moving squares show what can be produced with a few simple variations.

I've been waiting a long time for someone to come up with a decent fractal tree designer, and **Fractal Trees** is exactly that. Forests of apple or pear trees are easily produced but it does take ages to grow an eight year old tree in summer with full foliage and maximum fruit. I could play with this all day.

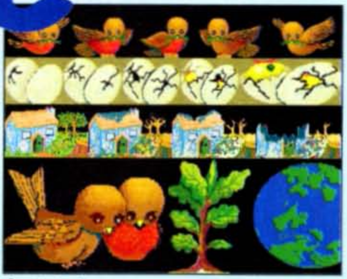
The program offers control of position, size and angle of the tree trunk, number of branches, years of growth, season, angle of branching for each year of growth, type and level of fruit and degree of foliage.

Trees can be saved to disc, so you could work on a forest adding a tree at a time. Trees can be printed out at any stage so you could develop a series of images showing a tree in growth, use printed trees in a collage, or drop them into a painting package for further work.

The second package features another five programs on four discs based, perhaps, more on maths than art, but there is still a lot of potential for art work linked to their use.

All the programs can be controlled either by mouse or function keys and resemble the BBC Micro programs on which they were based. This doesn't detract from their operation or the type of work able to be produced with them, but they don't have the same feel as the first set of programs.

Weaving offers a choice of two types of weave and gets pupils involved in complex design work. Strip weave and thread weave can be varied in size and produced manually or automatically. Ten pre-programmed rows of weaving can be designed and inserted at any point and the weft edited on the completed programmed weave.



Create tracks

Pattern allows you to produce patterns using lines in different colours. Up to four mirrors can be applied to the grid on which the pattern is drawn to reflect the designs and produce more complex patterns.

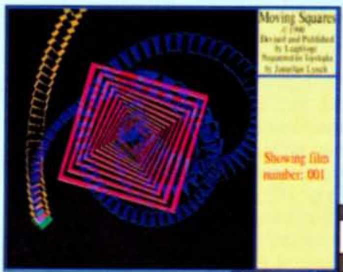
The result can be coloured in and the four most recently saved designs displayed to compare with the current pattern.

Bounce is a deceptively simple program offering four basic shapes in which to bounce a ball from a selected point and angle for a selected number of times. The ball then bounces around the frame producing elaborate and unexpected traces which can form a basis for projects.

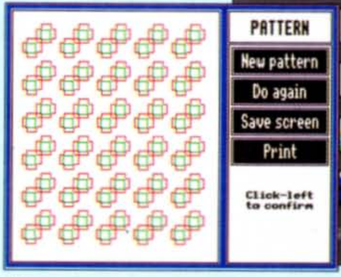
With **Tiling** you select one of four different shapes, deform them on a grid, choose two colours and produce the completed pattern on screen. A very simple program in concept and use, but one which produces interesting results.

Tracks produces images by controlling two points which act like a pendulum. These can be moved along their respective horizontal and vertical axes to produce varying tracks across the screen.

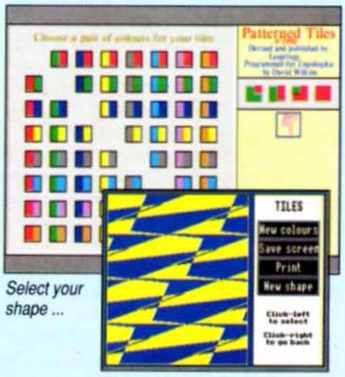
This is more like the first set of programs as it automatically displays previously saved images and uses the thumbs up icon to give you access. Numerous help screens are available.



Animate squares



Mirror patterns



Select your shape ...

... and create tiles

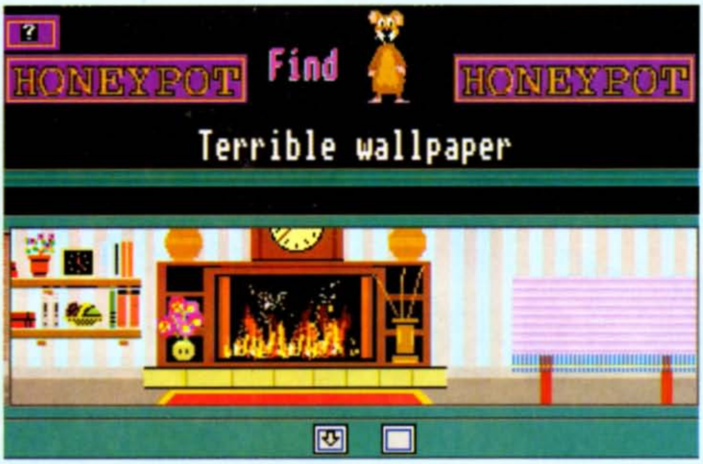
The mother bird sits on the

Display your designs

A better class of adventure

Bob Redrup examines a tasty offering

Program: Honeypot
Price: £44.25
Supplier: Resource, Exeter Road,
Wheatley, Doncaster, South Yorkshire
DN2 4PY.
Tel: 0302 340331
Requirements: 1Mb Archimedes



Terrible wallpaper

A well-designed screen announced Honeypot, a picture of an engaging mouse which answered to the name Albert, and a list of options numbered 1 to 5 invited me to Explore, seek Information, Find the Mouse, Hide the Mouse or Finish.

Not being particularly adventurous, I tried the Explore option – and wandered into a delightful world of fantasy with solid educational implications.

Honeypot is almost entirely mouse driven. Aiming the pointer at the figure 1 and pressing the left-hand button on my mouse started me on the Explore option: Pressing 1 on the keyboard had the same effect.

The screen is composed of two parts: A sideways scrolling, beautifully designed graphic scenario – a village, some countryside, water and so on.

Below the screen are a number of icons – an arrow pointing left, plus and minus signs, a green rectangle within a slightly larger one, a small red square within a rectangle that extended along most of the width of the screen and, finally, an arrow pointing right.

Trying the right arrow produced a silky-smooth scrolling effect so I began my travels: Visually I discovered a great deal, verbally little, though I worked out what the green rectangle and red square did.

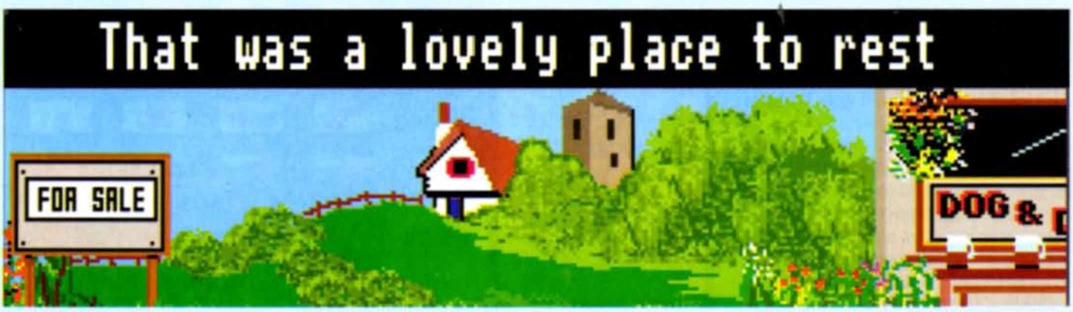
The green rectangle depended upon the plus and minus icons: Clicking on the plus made it wider and the minus made it narrower. This in turn controlled the red square.

Clicking the pointer a little to the right of the red square made the square jump towards the pointer, and it soon became clear that the distance jumped corresponded to the width of the green rectangle. The graphic display jumped – instead of scrolled – proportionately.

This meant that I could browse steadily through the scenery, or dash rapidly from end to end. Now it was time to seek some Information, so clicking the pointer on the question mark returned me to the main menu and thence to Option Two.

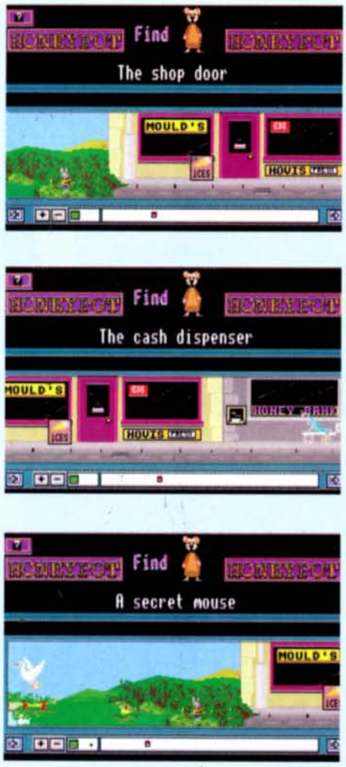
I started by clicking the pointer on various aspects of the scenery. What looked like an old abandoned bedstead was described as *A load of rubbish* in easily read script. Doing this on a pig produced two messages: *At the end of the wood a Piggy Wig stood* replaced the information about the rubbish, and – at the very bottom of the screen – I was told: *This pig is called Clarence. He is a special friend of William Mouse.* Clicking the pointer on various parts of the scenery produced varied descriptions, and I could even gain access to many of the buildings shown. Houses, shops, a church, castle and other places were explored and often detailed descriptions were given of the interiors and contents.

The Find the Mouse option had me exploring thoroughly until I was greeted with the furry friend of the initial screen and the message *Hello Albert, found you* followed by an invitation to do it again or fin-



That was a lovely place to rest

Taking a walkabout



Looking for the mouse

ish. The Hide option enables the player to explore and by clicking the pointer on Albert, hide him in one or other of the buildings.

It is a brilliant piece of software for top infants and juniors. The Explore option provides superb opportunities for observation – using the Information option – and recording. There's a kitchen where almost every cupboard has a different description so far as contents are concerned.

A full teacher support package is provided with project ideas, a second disc to be used by pupils for story creation on the Honeypot themes, three illustrated story books and an A3 size picture book to complete the value-for-money bundle.

As a piece of fun towards the end of term, Honeypot could be used as a sophisticated alternative to Hangman and similar games, but I think that the main use is that of stimulating observation and recording skills together with creative writing.

It is one of the most user-friendly pieces of software I have encountered in a very long time.

Summing up

I've one gripe: I live in an area bereft of Archimedes computers, educationally speaking, and as a school governor am grieved to think that, once again, children with humble BBC Micros won't benefit from a great package.

Buy 'em Down

Can Rog Frost come out on top in the taxing world of business?

Product: Buy'em Down
Price: £40
Supplier: RBRC Software, The Guild House, 32 Worple Road, Wimbledon, London SW19 4EF.
Tel: 081-946 8641
Requirements: BBC B and Master with 80 track drive

BUY 'EM Down is a business type simulation game in which players must buy the raw materials required to run a manufacturing process as cheaply as possible. The program is described as a teaching topic designed as a fun game, with wider applications than the immediate training objective.

A tutorial explains why the prices of raw materials vary from time to time as a result of market forces and attempts to reduce this phenomenon to a mathematical equation.

This equation turns out to be a sine wave and the tutorial allows users to vary a number of parameters to observe the effect this could have on prices.

I am not in any way involved in buying raw materials and consequently learned something from this interesting tutorial. But I feel that younger users might find it rather heavy going.

Two other parts of the program are the actual game. One version, the demonstration game, is just a cut down version of the real thing so I'll confine my review to the actual game.

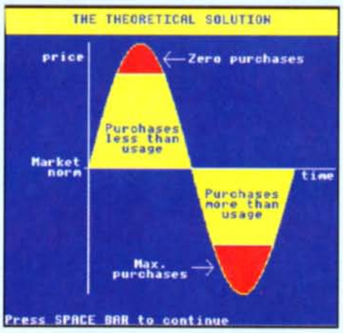
You take the part of a buyer obtaining a raw material for a process. This is rather abstract and I would have preferred to see real commodities for real industrial activity.

You have been provided with enough cash to keep operating for two years, told the maximum stock you may hold and the minimum you must keep.

Penalty costs are incurred for failing to observe these limits.

Each week you are told the amount of stock used and the current price of raw material. It is then you decide how much to buy.

Every 13 weeks your performance is assessed and you are awarded an index.


THE THEORETICAL SOLUTION
price
Zero purchases
Purchases less than usage
Market norm
time
Purchases more than usage
Max. purchases
Press SPACE BAR to continue

Raw material costs

The lower the index, the more successful you have been. This process continues for 104 weeks and a final rating and message is given.

To add extra complications, the game allows for a holding charge for stock and interest payments. An extra facility allows you to sell raw material if you have surplus.

I can't say I was particularly impressed with this program. Maybe I was put off to start with, when a standard Shift/Break produced an error message.

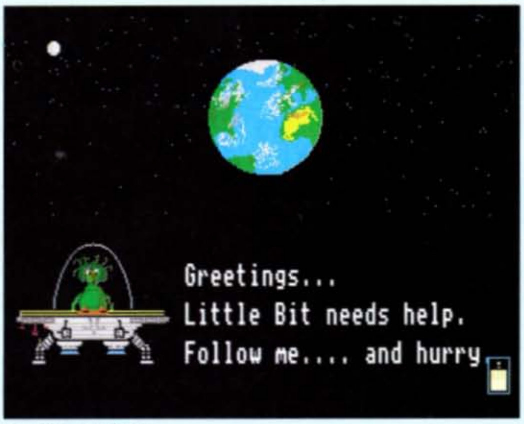
Perhaps I was annoyed with the frequency of another bug which kept telling me I was trying to buy too much stock, charged me a penalty and then told me I had to have the amount I had requested.

Or was it just that the program was too simple? I scored excellent ratings each time I played, no matter if I chose easy or difficult options.

Either the game was just a little mindless or the tutorial had already done a first rate job in teaching me the skills of buying!

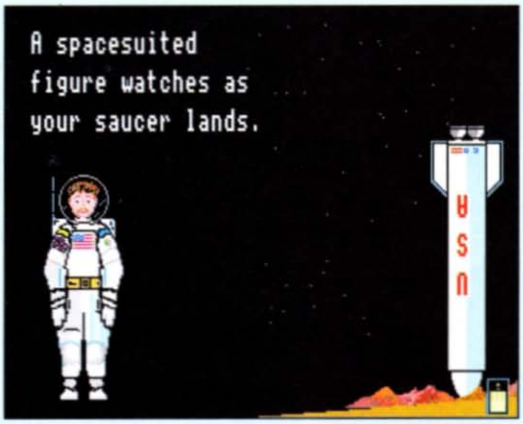
Summing up

I could see some use in the program, were the bugs eliminated, with groups of youngsters sharing the decision-making process. The benefits would involve not so much buying skills as the discussion and handling of quantitative data. Mind you, the asking price is still too high to justify purchase.



Greetings...
Little Bit needs help.
Follow me.... and hurry

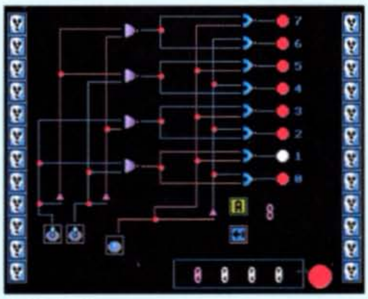
Meeting an old friend ...



A spacesuited
figure watches as
your saucer lands.

... and a new one

Ashes to ashes



Logic Puzzle

Product: Dust
Price: £30.50
Supplier: Resource, Exeter Road, Wheatley, Doncaster DN2 4PY.
Tel: 0302 340331
Requirements: BBC/A3000 or Archimedes series

Ian Dickinson assesses a new resource

I AM sure that maths was never quite this much fun when I was at school. There is already a good selection of mathematical software to aid day to day teaching. Many pupils and teachers are familiar with Droom, for instance. Now comes Dust, a mathematical educational adventure program.

The Archimedes graphics make the software exciting to use and the graphic manipulation is smooth and swift. Resolution of the display sprites is superb.

An adventure through space, Dust can be used by upper primary and lower secondary age pupils. You're presented with a whole series of mathematical and logic problems encouraging observation and communication skills. The program is divided into 10 chapters on two discs. All chapters introduce supplementary activities which can be taken up by the teacher.

Loading the program is the usual simple Risc OS interface and the program is mouse driven following the standard left mouse button selection of items.

Disc one contains the first five topics: The visitor; Mercury; The tower of winds; The temple of ages; Asteroids. The second disk contains: The volcanoes of Io; Memas, moon of Saturn; The kinder words; The ice mice, Star birth.

These chapter titles give a reasonable indication of the type of ideas introduced in the program. The Visitor sets the scene and introduces some the characters.

Then it is your turn as you input the navigator code giving the pupils control of the spaceship computer. The control panel is displayed and selection of the correct switches has to be made.

My class found some of the selections a little confusing, as some of the handles are at the side of the linked icons. It would have been better and more logical if linked icons were placed in a vertical plane, obviating any confusion.

Once they had overcome this they headed to Mercury – the next chapter of the adventure. Planets and space travel are the main theme and from Mercury you are directed to Venus and introduced to the Tower of Winds.

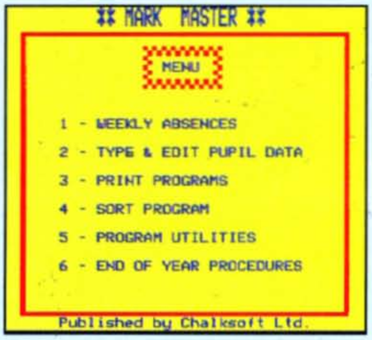
Princess Zia must be rescued from the tower by finding the fire berry to melt the Koch flake. Logic and reasoning skills are required to complete the task. From Venus, the adventure goes to Mars and the Temple of Ages. Success depends on children gaining access to the Temple and finding the four digit code to open the door. Then on to Jupiter and an asteroids encounter. Norman – one of our heroes – needs guiding through the hazards that lie before him.

Disc two continues in the same style with each chapter requiring pupils to use various skills in order to progress. The program shouldn't be used in isolation as it is possible to use Dust by building on the various themes.

A great plus of the program is that it can be used to develop many parts of the curriculum, depending on the teacher's interests and knowledge.

Summing up

Resource have once again produced a very usable program that can enrich classroom activity. DUST certainly acts as a stimulus to learning. Each school should have a copy for use in the curriculum.



```
** MARK  MASTER **

        MENU

  1 - WEEKLY ABSENCES
  2 - TYPE & EDIT PUPIL DATA
  3 - PRINT PROGRAMS
  4 - SORT PROGRAM
  5 - PROGRAM UTILITIES
  6 - END OF YEAR PROCEDURES

Published by Chalksoft Ltd.
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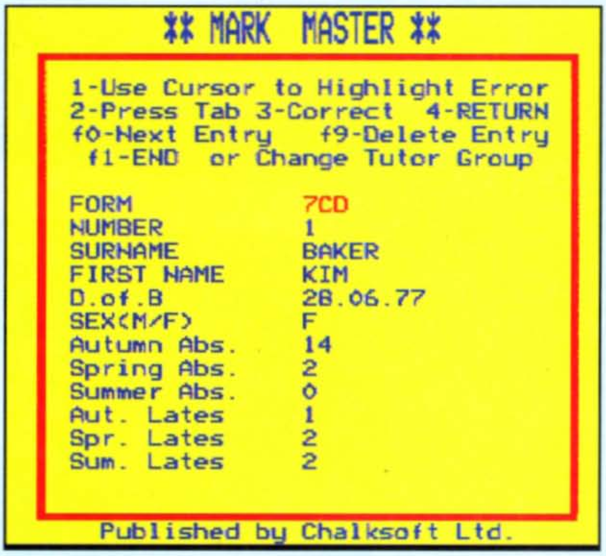
The main menu

Rog Frost reports on another administration program for teachers



```
            ** MARK  MASTER **

  1-Use Cursor to Highlight Error
  2-Press Tab 3-Correct  4-RETURN
  f0-Next Entry   f9-Delete Entry
   f1-END  or Change Tutor Group

  FORM            7CD
  NUMBER          1
  SURNAME         BAKER
  FIRST NAME      KIM
  D.of.B          28.06.77
  SEX(M/F)        F
  Autumn Abs.     14
  Spring Abs.     2
  Summer Abs.     0
  Aut. Lates      1
  Spr. Lates      2
  Sum. Lates      2

      Published by Chalksoft Ltd.
```

The Edit screen

Keep it on the record

Product: Mark Master
Price: £75 all versions
Supplier: Chalksoft, PO Box 49, Spaldings, Lincs PE11 1NZ.
Tel: 0775 769518
Requirements: BBC B, Master, BBC A3000 and Archimedes series

THESE days school seems to attract more and more administrative tasks. The Mark Master program is designed to help with one of these little problems – monitoring pupil attendance.

The program is limited by the nature of the hardware, as the BBC B or Master will be able to store limited information for up to 170 pupils in each of five years. The Archimedes version can cater for nearly ten times as many pupils in each of seven years. I worked on a BBC version for my review.

The package is essentially a database. You start by entering information, firstly the tutor group names then the details for each pupil within their tutor group.

On 32 bit machines this can include addresses, phone numbers and parents' names. On the more basic version just the forename, surname, sex and date of birth of the pupil is entered. Though a rather lengthy task, it only needs carrying out once for a child's entire school career.

Facilities exist for transferring forms from one year to the next, and an easy to use editor allows for the addition of new pupils or the removal of old ones.

The pupils are immediately sorted into alphabetical order on an Archimedes. Such a sort can be carried out on a BBC Micro but this involves choosing the sort option from the menu, a process which seemed rather slow.

Once set up, attendance data can be transcribed from a standard register – a fairly speedy job which need take no more than half an hour. The manual suggests doing this update weekly. Once again, a simple to use editor should help to eliminate mistakes.

Once an update is completed for a year, a printout is made of all those pupils with a poor attendance record – useful for the head of year or a welfare officer. A second printout places the tutor groups in rank order for attendance.

It is also possible to access information about pupils with, for example, excellent attendance records or poor punctuality. Standard tutor group lists can also be obtained and, perhaps, most usefully, searches by pupil age can be made.

The software is supported with a first rate manual. This gives really basic instructions about using computers and discs and also explains the importance of making regular backup copies of data discs.

Summing up

The manual gives some reasons for using the program, but these failed to convince me. Technically, I have no quibbles with this software but I doubt its real utility. The lists it produces just don't seem very useful. It is possible to scan a well kept register to learn the same information.

In any case, the pupils' computers at my school are far too busy to be tied up on such administrative tasks. Mark Master is another example of a pupil database which requires yet more typing in of routine data. The benefits do not justify the workload.

THE MAIN DIFFERENCE BETWEEN INTERDICTOR 2

AND A MODERN JET FIGHTER...

...ABOUT £20,000,000 (inc vat)

You'll also find a modern jet fighter a little too large for your tabletop and, unlike Interdictor 2, it requires around 25 groundstaff to get it airborne.

Best to stick with flight simulation, we think. And with that in mind, allow us to introduce Interdictor 2. It is written by the same people who brought you Interdictor but it's bigger, better, smoother and (believe it or not) faster.

It has a more realistic aircraft model, an easy to fly training mode, a new navigation system allowing route planning, way point setting and mission pre-planning. Added to this is LOCSAC a new local Situational Awareness Computer that allows you to monitor the local situation. You'll fly over 10,000 square kilometres of trees, mountains, roads, rivers, railways, lakes and much, much more.

The main scenario contains nine sub scenarios of varying difficulty. There are more types of air and ground vehicles with more weapons. Enemy aircraft have more in-built intelligence and defence, and let's not forget one vital point; they're all out to get you. And there lies the real difference between a genuine jet fighter and Interdictor 2.

If you get shot down, with Interdictor 2, you simply start all over again. And, by the way, Interdictor 2 only costs **£34.95 (inc VAT).**

CLARES
MICRO SUPPLIES

98 Middlewich Road, Rudheath, Northwich, CHESHIRE CW9 7DA.
Telephone: 0606 48511 Fax No: 0606 48512

STOP the presses!

Yet again Rog Frost dons his green eyeshade and prepares the latest edition

Program: Deadline Plus
Price: £28
Supplier: Mercury Educational Products,
8-10 Lower James Street, London W1R 3PL.
Tel: 071-287 5060
Requirements: BBC Master

DEADLINE Plus represents the latest attempt to squeeze a quart out of a pint pot. You've guessed it! It's a disc-based desktop publishing program for the old, favourite BBC computer. The program is packaged with extra materials designed to make the product easy to use by any teacher attempting a news theme.

Let's start with the bad news. The discs are in the ADFS format, so are only suitable for the Master series. I know that ADFS frightens many teachers, but the manual explains how to sort this out so it should present few problems.

More seriously, twin disc drives are essential. This makes for ease of use, but there seems to be no option to use a single drive with the disc swapping it would entail.

Schools with a network need not worry – instructions are given for installing Deadline Plus on to such a system.

To run, the program disc is placed in drive 0 with a data disc in drive 1. They can stay in place for a whole session. Booting the disc with Shift/Break brings up a menu of options, one of which allows you to select pointing devices and printer types.

The program works perfectly well using the cursor keys, but a mouse certainly speeds a number of processes.

Also available from this initial menu is a font editor. Creating whole fonts – 26 capital letters plus 26 lower case, not to mention numbers – is a lengthy process in any program. The Deadline Plus editor works as well as any other, but the task is not for the faint hearted. A number of perfectly acceptable fonts are provided with the program.

If the Enter Deadline option is chosen a grid representing an A4 sheet of paper is displayed on the left of the screen, while a graphical set of menu options is on the right.

The general format for Deadline Plus pages is four columns. Standard text will always fit these columns, but text or graphics can occupy any required width. It is not possible to read text on the grid, which is merely designed to show layout. One of the options, a magnifying glass, will allow any part of a page to be read.

If the headline text option is chosen, a box can be drawn on the grid and a headline typed into it. Four heights of headline are available, but there doesn't appear to be any way of formatting large texts.

Option two is a simple text editor which allows short items of text to be written in word processor form. They can then be saved onto the data disc. Function keys are used to create sections of bold, underlined or reverse video – white on black – effects.

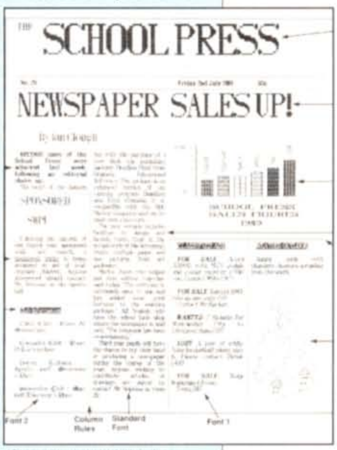
Having composed a story, it can be "flowed" on to the grid. You control where it starts and can adjust when a second column begins. This process is a little fiddly but it does give control over the final layout.

Different fonts may be used and you'll need to know their filenames before you start. Text can also be accepted from standard wordprocessors such as View, and the program intelligently strips out control codes from other wordprocessors.

The next option is a simple line drawing editor, a pretty basic affair but which can produce worthwhile graphics. The program comes with a file of pictures suitable for weather forecasting and you can also use pictures from other graphic programs.

An erase option allows whole areas of text or graphics to be removed at a stroke.

Page storage and Epson print facilities complete Deadline Plus, and if you have the hardware it is easy to use and well worth considering for simple DTP work.


THE SCHOOL PRESS

NEWSPAPER SALES UP!

Font 2
Column Rules
Standard Font
Font 1

Sample output from the program manual – but presentation leaves a lot to be desired

The support materials are based around an aircraft hijack at Larnaca Airport. Another disc contains a teleprinter program which releases news of events, eyewitness reports and interviews with relatives of victims in a realistic news room manner. Incomplete news pages are available on disc for editing in the Deadline Plus program.

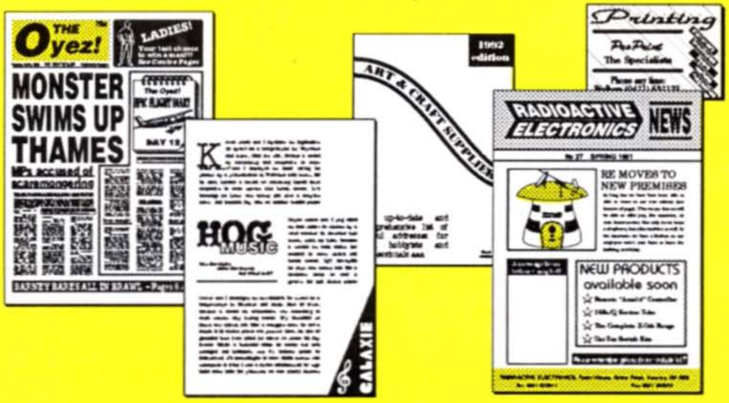
Yet another disc contains Key database files on aircraft and hijacks, allowing budding journalists to research the story's background.

Summing up

This is a superb package with great potential, particularly in the secondary school. A pity you need twin drives though.

POSTER

An object-based DTP package which allows you to do far more than create posters. In fact there isn't much in the way of DTP design and layout that can't be done with Poster. It's almost an art package. The application is fully RISC OS compliant so can 'talk' to Edit, Draw and any other RISC OS program. Poster comes with its own set of unusual outline fonts but will allow you to use any RISC OS outline fonts. It also has a huge collection of interesting borders and clip art. Two features place Poster in a different league from other packages. Firstly, you can do wonderful things with text. It can be made to flow along any path or it can be moulded into virtually any shape (as can outline Draw files). Secondly, the size of your document is not dependent upon the limitations of your printer. Poster will allow a document of any size to be created (although 100 metres square is not very practical). It then prints the document in sections which can be cut and assembled using the trim marks. Poster documents may be used in other DTP packages.



created with POSTER, EDIT and DRAW

SNIPPET

A utility which will make you wonder how you ever managed without it. Snippet will allow you to print or save any part of any screen. It will even cope with most programs running under the 65Host BBC Emulator. But Snippet will allow you to do lots more. Sprites may be converted from one mode to another and even 8 bit BBC screens may be easily converted into Archimedes sprites. A vast array of tools allows you to trim sprites, add borders, change colours, use outline fonts to add text, edit pixels, rotate sections and combine any number of sprites to make a single sprite. A carousel allows sprites to be displayed.

ALSO...

JIGSAW — allows sprites of any size to be converted into jigsaws with real jisaw-shaped pieces. It comes complete with a set of pictures including some by the well-known artist Rodney Matthews.

JIGLET — the version for younger users. It has fewer pieces and a more appropriate set of pictures.

CRAFTSHOP 1 and CRAFTSHOP 2 — programs allowing those with limited artistic ability to create some stunning results. Both packages are currently in use in thousands of schools and homes.

	£
POSTER	89
SNIPPET	29
JIGSAW	29
JIGLET	29
CRAFTSHOP 1	29
CRAFTSHOP 2	29

PRICES:
include P&P
include site licence
exclude VAT @ 15%

COPY PROTECTION

We believe that Archimedes users should be able to:

- **install software onto hard discs easily**
- **make as many copies of discs as required for their own use**

Therefore we do not:

- **make discs impossible to copy**
- **issue site licences at three, four, or even more, times the single-user price**

We have a single price. Discs may not be copied until they have been initialised by entering an ID (such as a name). A registration card bearing the ID is returned to us. This not only assists us but also helps to ensure the security of users' copies.

"RISCOSITY"

We also believe that Archimedes software should comply with RISC OS guidelines. We have a large number of products currently under development. All of them will be RISC OS compliant.

4MATION

4MATION
Linden Lea • Rock Park
Barnstaple • Devon • EX32 9AQ
Tel: (0271) 45566 Fax: (0271) 22974

Diary of a game

Steve Parkinson continues his exposé of game writing for the BBC Micro

October...

WORK started on the moon scene this month, and another quick brainstorm with RW got well under way. Came to the conclusion that this routine will be the one which gives you the oppportunity to pick up necessities like energy, fuel and so-on.

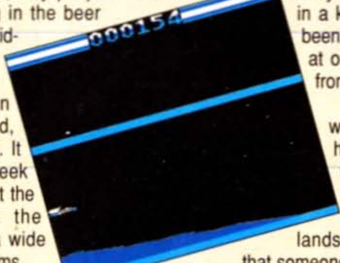
Can't decide whether this scene should kick off with Hugard running barefoot over the rocky terrain, or flying in a pod dropped by the time craft. Ho hum. Mustn't lose sleep over it.

Waking up to a fresh morning and the thought of yet another long day at work – part time programming was never meant to be easy – made me come to the decision that Hugard's mode of transport is to be the pod. Amazing what sleep can do.

No matter, RW and I seem to agree on other aspects such as having a multi-speed scrolling landscape as opposed to travelling at a fixed rate of knots.

Was thinking of using the landscape solely as a background design which would give the impression of movement and also allow the ship to fly *in front* of it. Decided against it due to the possibility of an extremely high boredom factor. Nope. The pod will disintegrate on contact with the landscape.

Thrashed out the more cosmetic problems, like what colour schemes are to be used – extremely important – how the planet routine can be visually tied in with the transporter from the space scene and, most importantly of all, why people seem to insist on sitting in the beer garden in the middle of October. Funny, that.



All foreseen problems solved, the work began. It took about a week and a half to get the landscape on the move, due to a wide variety of problems.

One time the landscape vacated the screen at tremendous pace and proceeded to plough through the Basic assembly listing. Oh great.

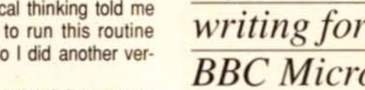
Immediately set the program to grind to a halt whenever anything other than screen memory was accessed in the display routine. This enabled me to track down what eventually turned out to be an extremely silly mistake – like most of 'em. Corrected what I hoped to be the final problem which made the landscape glitch quite badly – yeuch.

I initially thought that the routine was just too much for the poor machine: One frame of game would take longer than one screen refresh, but a little logical thinking told me that it should be able to run this routine standing on its head, so I did another version.

Was graced with a delightfully smooth, single colour landscape which actually stayed on the screen. Not a glitch. What on earth was I doing last time?

Increased the length of the landscape and made it loop back to the beginning to prevent me flying off the edge. De moon ees flat, señor.

Added a few stars to give a subtle background effect and gave the landscape foreground priority over them. A bit unnecessary, really, but more of an addition to the neat touches department than anything else.



Started work on designing a suitable craft to sweep menacingly across the landscape under the player's control. Used the same Basic driven, steam-powered designer as the one used for the loading screen to Hyperball.

The intention was to get a slick-looking craft while maintaining the ability to deliver awesome firepower. Wasn't easy. The two just didn't seem to go together.

The latest version is a craft with the ability to display the selected weapon in a kind of a bolt-on form, having been taken from the moon's surface at one time or another, or swiped from one of its inhabitants.

Pretending that the weapons were all fitted as standard would have been a little too far-fetched. You want a weapon that badly? You fight for it.

Incorporated the ship into the landscape routine, only to realise that someone had set the designer's colour palette incorrectly, and two of the colours were in each other's place and made the ship the same colour as the landscape – dullsville.

A small Basic routine soon sorted this out, and in no time at all the craft was showing its true colours. Gave the craft vertical movement, which mixed in with the apparent horizontal movement rather well.

Went back to the designer – with the correct colour settings this time – and came up with a numeric character set for the score. This too went in with the moon routine, and the screen is now blessed with a double height, multicolour score.

I'd love to make it bigger, but that will depend on the final length of the program. We'll see.

At one time I enabled the score to bounce gently up and down throughout the game. Unfortunately I found it took up too much valuable processing time to be continually bouncing, so now it only does it when it is increasing your score. Spent a bit of time re-familiarising myself with the starfield routines. Both the starfield and planet routines have to be resident in memory at the same time, so their length and complexity is going to have to be closely observed.

Actually found time to install a firing routine which, when Return is pressed, shoots a bullet relative to your current speed.

Won't be putting in any collision detection until a much later stage simply because I'll want to be able to test the game right through before I start messing around with the lives system. Besides, I've got a universe to design yet.

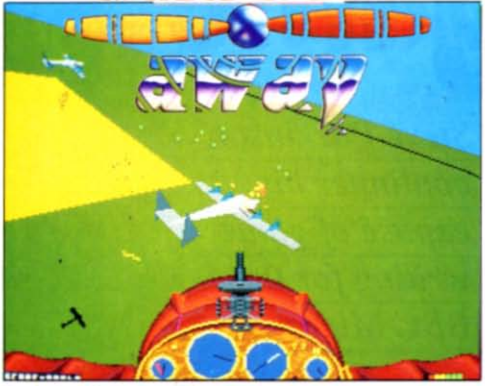
As usual, the end of yet another month sneaks up from behind and, with one sharp thrust, pushes the unexpecting programmer into a new month, and a wonderful new selection of problems.

● ***Will there be enough room for a bigger score? Doesn't using a screen designer to design sprites seem like an irresponsible and blatant misuse of software? And will I be hearing from the Flat Moon Society, so they may set the records straight once and for all? The only way to find out is to keep on reading the diary of a game.***

A3000
ARCHIMEDES
BBC B/MASTER
ELECTRON

THE 4TH

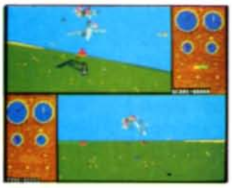
Chocks Away



Chocks Away is flight simulation the way you've always wanted it. It has everything for the beginner and the expert:

- Beautiful solid 256 colour graphics and 'nerve shattering' digitised sound effects.
- You pilot a very easy to fly, yet highly manoeuvreable bi-plane - ideal for all ages and skill levels.
- Revolutionary 2 player option using split screen display. This allows 2 players to each fly their own planes simultaneously in practice or on missions.
- Full joystick, dual joysticks, mouse and keyboard control options.
- Amazing "Black Box Flight Recorder" included so that you can record your own flights and then save and replay them.
- Learn landing, loops, rolls and other stunts the easy way by watching the 90 minutes of totally absorbing pre-recorded training flights included with the game.
- Powerful 30mm cannon capable of very rapid fire and long range destruction.
- Easy to read instrument panel and simple controls so you can concentrate on developing your flying skills.
- Internal and external views of your plane can be selected at any time from front, rear, left and right.
- 3 very varied immense maps to explore - approximately 18000 km² in total (6000 km² per map).
- 20 fascinating and varied missions of increasing complexity are included to guarantee weeks or even months of enjoyment.
- Promotion system from Cadet status right through to Marshal of the RAF.
- Realistic take-off and landing from runways and aircraft carriers.
- Special 2 player dogfight feature where your only aim is to shoot down your human opponent.
- Superb range of targets and enemies including bombers, triplanes, powerful fighters, tanks, ships, control towers and anti-aircraft guns. Up to 7 aircraft can be in a single encounter.
- Beautiful scenery including bridges, churches, houses, rugby pitches, warehouses, lighthouses and trees.
- Permanent high-score table which is saved automatically to disc.

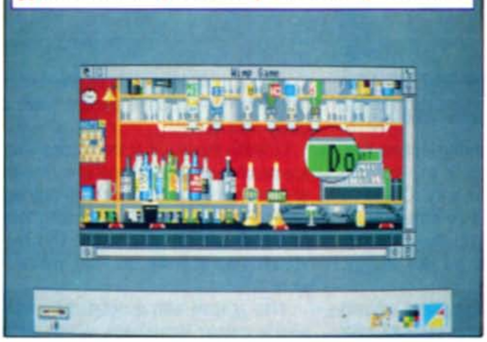
Price: A3000/Archimedes £24.95



Mission Brief
PRESS FIRE

The Wimp Game

Windows - Icons - Mouse - Pointer



The Wimp Game is a brilliant pointer driven graphic adventure celebrating over 10 years of Acorn Home Computers. This revolutionary multi-tasking game is unlike any other game produced for the Archimedes and even allows you to run other programs whilst you play it.

Work your way through the very different and very detailed locations using your pointer to try out the many objects and your magnifying glass to examine them.

The Wimp Game has no time limit, no help, no hints, no score, no little green men, no space ships, no bombs and no guns. No keys on the keyboard are used. Your aim is to progress from being the owner of an Acorn Atom to being the owner of an Acorn R200 workstation - who said they'd already got one?

You can click on some objects and drag others about - click on the light switch in the first room and you'll see how it works. The 'adjust' button on the mouse will activate the magnifier to let you examine the scene in more detail. Be careful where you click - anything which hurts in real life will probably also do so in the game.

Price: A3000/Archimedes £19.95

This 4 game collection really is The Real McCoy. These are genuine top games in their original format with full instructions. The games have been carefully selected for variety and include a thinking game, a sports game, a role playing adventure and an arcade game. Bought individually they would cost £81.80p making this a very prestigious special edition collection.

U.I.M. (RRP £29.95)

U.I.M. (Ultra Intelligent Machine) is a futuristic action adventure set in the oceans. It is a huge game featuring solid 3 dimensional graphics and digitised sound effects. You must travel the oceans in your highly expandible submarine visiting the numerous ports throughout the ocean networks. As well as gaining combat skills you'll need to learn to trade in commodities, shares and currencies. There are over 250 missions to complete before you will find your goal - the U.I.M. - created to be almost a god.

Price: A3000/Arcl

A3000/Archimedes Games and Prices

Chocks Away	24.95	UIM (3D Action Adventure)	29.95
The Wimp Game	19.95	E-Type (3D Car Racing)	19.95
The Real McCoy	29.95	E-Type Designer	16.95
Dropship	19.95	E-Type Extra 100 Miles	16.95
Break 147	24.95	White Magic (Arcade Adventure)	19.95
Nevryon (Pure Arcade Action)	19.95	White Magic 2 + Designer	19.95
Pysanki (Arcade Adventure)	19.95	Arcade Soccer	19.95
Inertia (Isometric Action)	19.95	Holed Out (3D Golf)	19.95
Apocalypse (3D Mega Game)	29.95	Holed Out Extra Courses 1	16.65
The Olympics (6 Events)	19.95	Holed Out Extra Courses 2	16.95
Man-At-Arms (Arcade Adventure)	19.95	Holed Out Designer	19.95

All the above Archimedes games will work on the Archimedes A3000, 310 and 400 series

BBC & Electron Games	BBC B and Master 51/4" Disc	BBC and Electron Cassette	Master Compact 31/2" Disc
UIM (3D Action Adventure)	19.95	-	21.95
E-Type (3D Car Racing)	14.95	9.95	15.95
Inertia (Isometric Action)	12.95	9.95	13.95
Nevryon (Arcade Action)	14.95	-	15.95
White Magic (Arcade Adventure)	12.95	9.95	13.95
White Magic 2 + Designer	12.95	9.95	13.95
Arcade Soccer	12.95	9.95	13.95
Holed Out (3D Golf)	14.95	12.95	15.95
Holed Out Extra Courses 1	11.95	9.95	12.95
Holed Out Extra Courses 2	11.95	9.95	12.95

All the above BBC games are compatible with BBC B, B+ & Master Series Computers

DIMENSION

A3000
ARCHIMEDES
BBC B/MASTER
ELECTRON

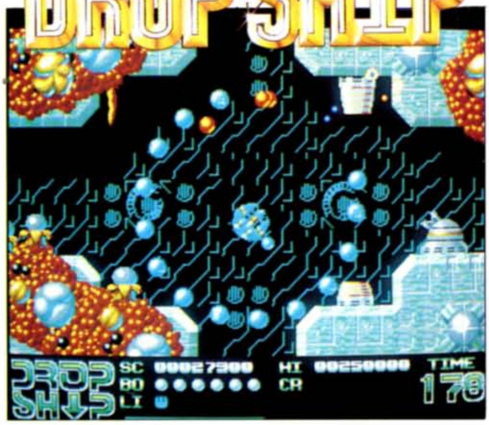
ARCADE SOCCER (RRP £19.95)
Arcade Soccer really is WORLD CUP FOOTBALL ACTION at its very best. Using an overhead view to make gameplay as exciting as possible it features everything that you could want in a football game.

WHITE MAGIC (RRP £19.95)
White Magic is a unique arcade adventure in which you control 4 varied adventurers:- A Leprechaun, Titan, Warrior and Enchanter.
You can transform between all 4 characters at will and use their much needed special abilities. White Magic is not a game for the faint-hearted; it is a fast-action game which requires fierce hand-to-hand combat and frantic weapon fire.

QUAZER (RRP £11.95)
Quazer is a fast action arcade style game with excellent music, sound effects and graphics. It has 11 incredibly detailed and varied vertically scrolling levels filled with the most amazing assortment of baddies you are ever likely to see.

imedes £29.95

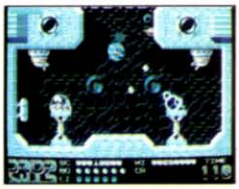
DROPSHIP

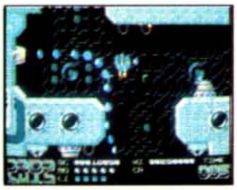


Drop Ship is one of the smoothest and fastest arcade games you are likely to see. It features superb 256 colour graphics, 15 increasingly large and diverse stages and an excellent stereo soundtrack.
The year is 2020....
The government proudly announces that the new fast breeder farm on the Mars colony is completely computer managed and totally safe, defended from attack at all times by a fully-automated tactical defence system.
The year is 2030....
Earth receives a transmission from the Mars colony. The radiation seems to have affected the management software at the fast breeder farm. The defence systems have gone haywire and the whole farm is rapidly approaching meltdown. If all the reactors are not shut down the Mars colony will be wiped out....
Shut down can only be achieved by removing and collecting the power crystals from each reactor. An almost impossible task made even harder by the fact that the defence systems are blowing away anything that moves. The defences include gun emplacements, artificial gravity generators, sporers and hoards of deadly aliens.
What is needed is a craft which is supremely manoeuvrable, capable of great speed and possessing awesome firepower, and a pilot of extraordinary bravery to fly it.
The craft is the Drop Ship.....
The pilot is You.....

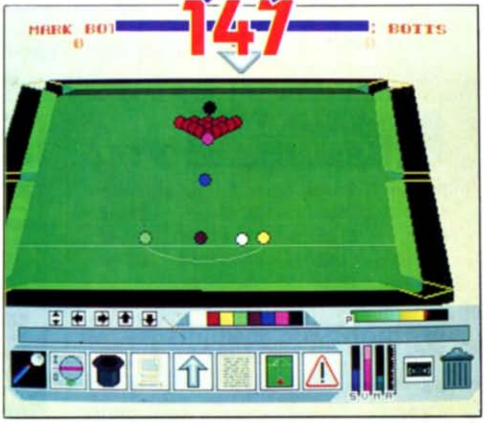
MORE GAME INFO
Frame rate: 50 frames per second
Maximum objects on screen: 150 per frame
The game features completely custom-written screen handling routines
No use whatsoever is made of the operating system routines
The ship movement in the game is accurate down to 0.0001 of a pixel

Price: A3000/Archimedes £19.95





BREAK 147



By any measure snooker is one the most popular sports in the world today. Break 147 has been precisely designed exclusively for the A3000 and Archimedes computers to be as close as is possible to the real game itself.

Break 147 is a full 3D snooker simulation with superb solid graphics and brilliant digitised sound effects, speech and music. The game is controlled exclusively with the mouse.

It features incredibly realistic interaction between the balls and precise control of the cue ball - topspin, backspin, stun, screw, drag, swerve and masse shots. You can view the table from ANY angle or distance even as the balls are moving.

All the rules are fully implemented and you can play matches (against friends or computer players), trick shots or just practice. You will not only be able to replay your last shot but you can also replay whole frames and move in and around the table as you watch it. Highest breaks are saved automatically to disc.

You can even create and edit your own tables so you can design your own trick shots or set up your preferred practice positions. A manual is supplied with each game which gives the fascinating history of snooker and all the rules and instructions required to play BREAK 147.

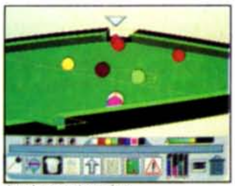
You will find that the game plays as if you were on a real snooker table with all the attendant features to take care of, but with a lot of the tedious parts - such as resetting the table, respotting the balls, and scoring - maintained by your computer.

RELEASE
POSTPONED
Expected new release
March - May '91

Win a Superb Engraved Trophy
This unique competition allows everyone who obtains a break of 100 or more to win a superb engraved snooker figurine on a solid marble base.

There's also a superb 16" trophy (to be engraved with the winners name) which will be awarded to the first entrant to achieve the maximum break of 147. Full details and entry coupon are included with the game.

Price: A3000/Archimedes £24.95
Anticipated Release Date: Mid November '90



Screen shots from early development version

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Archimedes micro

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410/1	£1099	£1159	£1288	£1448
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440/1	£1699	£1759	£1888	£2048
540/1	£2995	£3065	£3184	–

Archimedes A3000

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(Extended by Popular Demand)

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Micro	Free Offer
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A420/1	Upgraded to 4MB RAM 40MB Hard Disc (A440), MK II Learning Curve pack and Acorn DTP pack
A440/1	High Res 14" Multiscan Colour Monitor
540/1	High Res Multiscan Monitor & Panasonic KX-P1180 Printer
A3000	Upgraded to 2 Megabyte of RAM

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P.S. A310 upgrades require a backplane and a fan.

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• **4HD40** – 40Meg Hard Disc for 410	**£269**
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The accepted standard for Archimedes computer expansion is the Acorn Podule, designed initially to fit the old 310, and also for the later A400 and A400/1 series micros. The podules fit inside these computers up to four at a time. The A3000 is the little brother of the family, but can only have one podule at a time, plugging into the back of the computer.

Other attempts have been made to expand the A3000 by trying to introduce a 'mini-podule'. This is impractical for many reasons, amongst which is the reluctance of manufacturers to produce them. Nobody wants to re-design podules already produced. Some cannot be produced on a 'mini-podule' as they are far too complicated and simply wouldn't fit.

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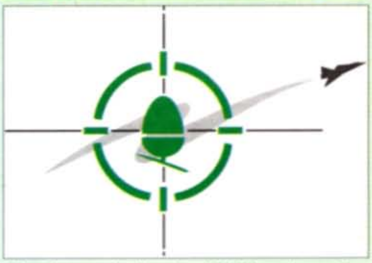

Take the new Archimedes 420/1 Learning system home by booking a slot in Watford's Acorn approved Test Schedule. Call in at our showroom and check it out for yourself – Leave a deposit and you may borrow one of our specially chosen Learning Curve System for up to 14 days. Be satisfied before you buy. Return the system in good order for a complete refund. At the same time you may enter our FREE aviator competition. You could win stunning prizes; Fly in First Class Luxury in Concorde; Learn to fly a helicopter; Take a weekend of flying lessons; and many more prizes. So why not take a test fly at Watford.

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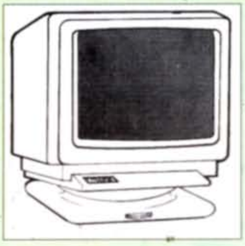
Continued→ → → → → → → → →



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STAR BUY

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(Securicor carriage on Monitors £7)

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Panasonic Accessories

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Swift 9	£198	Swift 24	£238
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Star Accessories

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LC24-200	£63		

Serial Interfaces

SPC-10	LC10; LC10-II; LC10-Col; LC15; LC24-10; LC24-15; LC-200; LC24-200	£49
8K Ser	LC-200; LC24-200; FR10; FR15; XB24-10; XB24-15	£64

Paper Roll Holders

LC-200; LC24-200; LC24-200 colour	£29

Buffers

32K Ram Card for LC24-10; 15 & 200	£55
32K Ram Card for XB24-10 & 15	£55

Ribbons

LC10; LC10-II; LC15	Black **£4;**	Colour **£6**
LC-200; LC24-200	Black **£5;**	Colour **£12**
XB24-10; XB24-15	Black **£5;**	Colour **£12**

Laser Printers

• Canon LBP-4	4ppm	£715
• Canon LBP-8 III	8ppm	£1249
• Epson EPL7100	6ppm	£749
• HP Laserjet IIP**	4ppm	£725
• HP Laserjet III	8ppm	£1199
• HP Laserjet IIID	8ppm	£1820
• Panasonic KX-P4420	8ppm	£699
• Panasonic KX-P4450i	11ppm	£1105
• Panasonic KX-4455 Postscript	11ppm	£1799
• Qume Crystal Print WP+		£749
• Qume Crystal Print Ser. 2		£1065
• Qume Crystal Print Publisher 2		£1899
• Star LP-8 II		£1099
• Star LP-8 Star(post)script		£1299

** Lower Paper Cassette Tray & Premier Collection Software, **FREE** with every HP Laserjet IIP printer purchased from us. Offer subject to availability.

Laser Toners

Canon 2 & 4	£60	Laserjet II & IIP	£55
Epson GQ	£18	Laserjet III	£75
Star LP-8	£69	Qume Crystal	£63
KX-P4420/50	£25		

Laser RAM Upgrades

HP Laserjet II RAM		Laserjet III 1MB	£129
Jetware II 1MB	£120	GQ5000 512k	£99
Jetware II 2MB	£199	KX-P4420	1M £249
Jetware IIP 1MB	£125	KX-P4450i	1M £299
Jetware IIP 2MB	£200	KX-P4450i	2M £575

Laser Drum & Developer

• Epson Drum	GQ5000 £129	EPL7100	£129
• Panasonic 4420 Drum	£69	Developer	£59
• Panasonic 4450 Drum	£99	Developer	£80
• Qume Drum	£76		

Jetpage Postscript Cartridge

for Laserjet II	£369	IID & III	£375

Epson Printers

EX800	**£410**	LQ1050	**£540**
EX1000	**£540**	LQ1060	**£619**
FX850	**£295**	LQ2550+	**£729**
FX1050	**£370**	LX400	**£117**
FX1060	**£599**	LX850	**£179**
LQ400	**£179**	SQ850	**£515**
LQ550	**£246**	SQ2550	**£779**
LQ850	**£439**	TLQ4800	**£1449**
LQ860 Colour	**£499**		

Cut Sheet Feeders for

EX800/FX800/850/LQ800/850	**£130**
FX1000/LQ1000/1050	**£175**
LQ2550	**£390**
LX400/800/850/LQ400/500/550	**£69**

Tractor Feed for

LQ800 **£44;** LQ850/FX850 **£69;** LQ1050/FX1050 **£85;** LQ2500 **£90;** LQ2550 **£90.**

Accessories

• EX800/1000 Colour Option	**£45**
• EX800/1000 Colour Ribbon	**£14**
• LQ2500 Colour Option	**£65**
• Multifont Card for LQ550/850/1050	**£95**

Epson Printer Interfaces

All these interfaces fit inside the printer

RS232	**£32**	RS232 + 2K Buffer	**£52**
IEEE 488	**£40**	RS232 + 8K Buffer	**£79**

Printer Leads

BBC Centronics 4' long	**£5**
BBC Centronics 6' extra long	**£7**
Compact's Special Centronics Lead	**£7**
Archimedes Printer Lead 6'	**£6**
Nimbus Centronics Lead	**£6**
IBM/Archimedes Parallel Lead 6'	**£6**
IBM/Archimedes Parallel Lead 5 metres	**£13**
IBM/Archimedes Parallel Lead 10 metres	**£19**
Double Ended 36 way Centronics Lead 4'	**£7**
Double Ended 36 way Centronics Lead 6'	**£9**
MSX Centronics Parallel Lead 4'	**£12**
RS232 Leads (Various)	**P.O.A.**
IBM Keyboard extension lead coiled	**£5**

Important Notice to All our Customers

Watford Electronics only supplies printers fitted with British Specification 240V AC Mains 3 core cable with connections for Live, Neutral and Earth. We do not sell, nor intend to supply grey imports from Europe or Hong Kong with incorrect 220V European mains connections (2 core cable!) which could be dangerous to the end user.

Megabuffer 256

The Smallest 256K Printer Buffer Unit in the world **38mm x 130mm x 134mm.**

This new Megabuffer 256 from Watford is a full featured 256K Printer Buffer. The features are:

- Improves efficiency by making more efficient use of computer and printer.
- Compatible with any computer and printer that uses Centronics Parallel connections including all BBCs, IBM PCs, etc.
- Total compatiblity with all software.
- Cheaper phone bills when using your Modems.
- Ideal for those doing large graphics screen dumps that are slow to print.
- Multi-Copy facility allows you to print several copies via Megabuffer without going through your computer.
- Data Dump facility is included.
- Built in text unit for both the buffer & your printer.

Only £119 (carr £5)

Universal Printer Sharers/Changer

Connect up to 5 Micros to 1 printer or 5 Printers to 1 Micro with our combined, Sharer/Changer. These Units are made to a very high standard. For extreme reliability, they all have Printed Circuit Boards mounted inside the case, (not a Spaghetti Junction of wires). Internal connection is made via high quality ribbon cables.

(Ideal for School environments)

Connects	Serial	Centronics	P&P
2 to 1	£16	£17	£3
3 to 1	£22	£24	£3
5 to 1	£36	£32	£4

(Cables extra at £6 each. Please specify type required when ordering)

2 Way Compact Printer Switch

A handy 2 way printer switch. Enables one micro to be connected to 2 printers or vice versa.

Centronics **£18;** Serial **£17**

(Cables extra at £6 each)

Auto Printer Sharer Switch

Connects	Serial	Centronics
2 to 1	£36	£39
4 to 1	£59	£55
8 to 1	–	£85

256k Multi Spooler

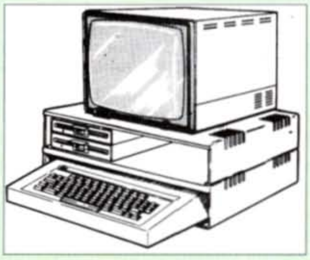
(Auto Printer Sharers – Centronics)

• 2 In/2 out	**£135**	• 4 In/2 out	**£169**
• 8 In/1 out	**£199**		

Compact Converter Units

Serial to Parallel	**£36**	Parallel to Serial	**£37**

Plinths for the BBC B & Master 128K Micros

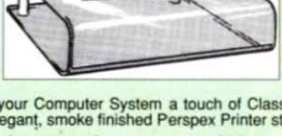


Protect your computer from the heat of your VDU. Our micro plinths have slots for maximum ventilation. The single plinth is suitable for a BBC and VDU, whilst the double height version provides enough room for our stacked disc drive and other peripherals like, Eprom programmer, music unit or simply discs & stationary. The computer slides neatly in the lower section allowing easy access to remove the lid. Colour: Matching BBC Beige.

Single BBC Plinth	420 x 310 x 105mm	**£13**
Double BBC Plinth	420 x 310 x 210mm	**£24**
Single Master Plinth	490 x 310 x 105mm	**£14**
Double Master Plinth	490 x 310 x 210mm	**£26**

(Carr. Single plinth £2; double plinth £3)

Perspex Printer Stand



Give your Computer System a touch of Class with our elegant, smoke finished Perspex Printer stand.

80 Column version	**£16** (carr £3)
136 Column version	**£20** (carr £4)

Listing Paper (Perforated)

• 1,000 Sheets 9.5" x 11" Fanfold Paper	**£7**
• 2,000 Sheets 9.5" x 11" Fanfold Paper	**£11**
• 1,000 Sheets 9.5" x 11" NCR 2 Part Fanfold	**£21**
• 1,000 Sheets 15" x 11" Fanfold Paper	**£9**
• 1,000 Sheets true A4 Fanfold Paper 70gms	**£11**
• 2,000 Sheets true A4 Fanfold Paper 70gms	**£21**
• Teleprinter Roll (Econo paper)	**£4**

(All our Fanfold paper is Micro perforated leaving a smooth clean edge when the tractor feed strips are detached).

Carriage 1K Sheets £2.50, 2K Sheets £3.00

Printer Labels

(On continuous fanfold backing sheet)

1,000 90 x 36mm (Single Row)	**£6.00**
1,000 90 x 36mm (Twin Row)	**£6.25**
1,000 90 x 49mm (Twin Row)	**£7.50**
1,000 102 x 36mm (Twin Row)	**£6.75**

CREDIT CARD 24 HOUR
Ansaphone Hot Lines
(0923) 50234 or 33383

Printer Ribbons & Various Dust Covers

Type	Ribbons	Dust Covers
Brother HR15/20	**£6.00**	**–**
BBC Micro	**–**	**£3.50**
BBC Master	**–**	**£4.00**
Archimedes Micro pair	**–**	**£9.00**
Citizen 120D	**£2.75**	**£4.50**
DMP2000	**£2.75**	**£4.75**
EX800/1000	**£3.50**	**£5.00**
RX/FX80/85/800/MX80	**£2.95**	**–**
FX/MX/RX100/1000	**£3.95**	**–**
Kaga/Taxan KP810/815	**£3.25**	**£5.00**
LQ400/500/550/800/850	**£3.25**	**£6.00**
LQ1050/LQ2500	**£4.00**	**–**
LX80/86/800/850	**£2.75**	**£4.50**
LX400	**£3.50**	**£5.00**
M1009/GLP	**£2.95**	**£3.75**
NEC P2200	**£4.50**	**£5.00**
Panasonic KX1080/81	**£3.25**	**£4.75**
Panasonic KX-P1124	**£7.50**	**£5.00**
SQ2500	**£23.00**	**£5.50**
Star LC10/NL10	**£2.75**	**£5.00**
Star LC24-10	**£2.95**	**£6.00**
Olivetti Ink Jet Cartridges (set of 4)	**£9**	

Our attractive Dust Covers are manufactured from translucent PCV. The seams are stitched and edges are taped to prevent splitting due to continuous use.

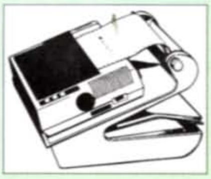
Original Panasonic Ribbons

Guaranteed to last 3 million characters

P110	for KX-P1081, 1592 & 1595	**£8**
P115	for KX-P1180	**£8**
P145	for KX-P1124	**£8**
P140	for KX-P1540	**£10**

Colour Ribbons for KX-P1081, 1592 & 1595
Brown, Blue or Red **£9.95 each**

Professional Printer Stand



The professional printer stand takes hardly more space than your printer. Due to the positioning of the paper feed and re-fold compartments ie. one above the other, the desk space required for your printer functions is effectively halved. Its ergon-omic design ensures smooth paper flow and automatic refolding.

80 Column version £23 (carr. £3)
132 Column version £28 (carr. £4)

Continued→ → → → → → → → →

Archimedes Real-Time Digitiser

Now supplied with NEW RISC OS Version Software

Watfords' Archimedes Video Digitiser is the most sophisticated digitiser ever designed for a micro. It provides a fast and flexible means of capturing images from a video camera or recorder for display and manipulation on the Archimedes range of Micros. Off-air televison signals may also be digitised via a video recorder or TV tuner. Please write for further details.

Price £175

A Set of Colour Filters for colour image grabbing using a video camera	£16
New Risc-OS Software Upgrade	£39

Archi Graphic Tablet

The Archi Graphic Tablet offers performance and accuracy comparable to other tablets priced at well over £400, and has the useful addition of a liftable cover, which can hold tracing material or menu templates securely. The package is supplied complete with sophisticated Archi software. (Now, fully LinCAD compatible. Recommended by Linear Graphic).

(FREE this month, PC Mouse Drivers & Art package)

(Now, fully LinCAD compatible. Recommended by Linear Graphic).

Special Price £225

(Price includes Tablet, Leads, Software & Puck)

Stylus Optional Extra **£29**

Disc Plonker Rack

When using ones micro, there is a tendency to have more than one Disc on the desk. This exposes them to the harzards of fingerprints, scratches, dust, coffee and an untidy desk. Why not protect your valuable data from all these hazards with the help of our extremely handy and low cost DISC PLONKER RACK. Holds up to eight 5.25" discs.

Protection at Only: **£2**

Acorn & Watford DFSs

• Watford sophisticated DFS ROM	£16.00
• Watford DFS Kit complete	£69.00
• We will exchange your existing ROM for Watford's ultimate DFS ROM at only	£12.00
• DFS Manual (comprehensive)	£6.95
• Acorn DNFS ROM	£17.00
• Acorn ADFS ROM only	£25.00
• Acorn 1772 DFS ROM Kit	£49.00

(The single Density DFS system is now old technology. Like Acorn, Watford too have decided to replace it with the their more up-to-date 1770 DDFS interface. We have informed most of the software houses of this decision in order that they can ensure compatibility with our highly sophisticated and fully Acorn compatible DDFS).

Watford's MkII 1772

Single/Double Density DFS

Many of our customers have wanted to use our superior DDFS and Acorn ADFS together. Now our Mk II DDFS Board with its 1770 Disc Controller, has been adapted to allow the use of Acorn ADFS as well. It also has all the commands of the Acorn's 1770 DFS, plus the added features.

Added features include:

- Acorn ADFS compatible – Use ADFS on our DDFS board.
- Tube host Code – No longer any need to have the DNFS in your machine to use Co-Processors, even the CoPro and Master 512.
- Auto 40-80 Track sensing – no need to fuss with 40/80 track switches (even works with protected disks).
- An extremely powerful 8271 emulation – ensuring compatibility with almost all software.
- New low profile – small footprint board.
- Fits with all third party ROM boards.
- Option to double the speed of file handling operations – BPUT and BGET.
- Operates in both single and double density modes.
- OSGBPB has been recoded, increasing still further the speed of file handling.

Please note that not all DDFS's are capable of providing either the full 80% storage increase or of allowing a file the full size of the disk – Ours allows both of these!

If you already have a DDFS (any manufacturer), and wish to upgrade to our MkII version, then simply return your existing ROM and DDFS board and we will supply the new DDFS for only **£39.00.**

• SPECIAL PRICE	£44.00
• DDFS Manual	(No VAT) £6.95
• We will exchange your existing DFS Kit for our sophisticated DDFS for only	£30.00

Please note, as the MkII DDFS is a hardware and sofware upgrade, it is not possible for existing Watford DDFS users to simply exchange the ROM for the new version.

3M – Diskettes

3M – SCOTCH Diskettes with Lifetime warranty from Watford Electonics your 3M Appointed Distributor

• *10 x 5.25" S/S D/D 40T (744)*	*£5*
• *10 x 5.25" D/S D/D 40T (745)*	*£5*
• *10 x 5.25" S/S D/D 80 Track (746)*	*£7*
• *10 x 5.25" D/S D/D 80 Track (747)*	*£7*
• *10 x 5.25" 1.6M D/S D/D High Density for IBM XT and AT*	*£11*
• *10 x 3.25" S/S D/D 40/80 Track*	*£7*
• *10 x 3.25" D/S D/D 40/80 Track*	*£8*
• *10 x 3.5" Double Sided High Density*	*£15*

Top Quality 3.5" & 5.25" Diskettes

To complement our range of Quality Discs and Disc Drives. WE are now supplying SPECIAL OFFER packs of 10 Lifetime guaranteed discs. Each disc has a reinforced hub ring. Supplied complete with selfstick labels and a Plastic Library Disc Box.

● *10 x **M3** 3.5" D/S D/D 80 Track*	*£7*
● *10 x **M9** 3.5" D/S High Density*	*£14*
● *10 x **M4** 5.25" S/S D/D 40 Track*	*£5*
● *10 x **M5** 5.25" D/S D/D 40 Track*	*£5*
● *10 x **M7** 5.25" D/S D/D 80 Track*	*£7*
● *10 x **M8** 5.25" D/S H/D Hi-Density*	*£11*
● ***M2** 3" Double Sided*	***£2.50** each*

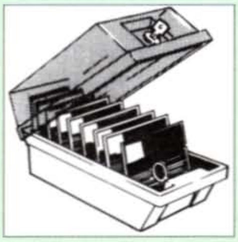
CREDIT CARD 24 HOUR
Ansaphone Hot Lines
(0923) 50234 or 33383

Floppy Head Cleaner Kit

The heads in floppy drives are precision made and very sensitive to dirt. The use of cleaner Kit is a sensible precaution against losing valuable data. It is recommended to clean the drive head once a week. it is very simple to use. Available in 3.5" & 5.25", please specify.

Price £4

Antistatic Lockable Disc Storage Units



Gives double protection – Strong plastic case that affords real protection to your discs.

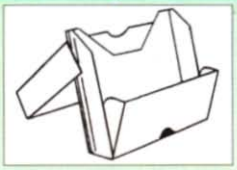
Antistatic helps avoid data corruption whilst in storage. The smoked top locks down.

Dividers and adhesive title strips are supplied for efficient filing of discs.

• **M35** – holds up to 50 5.25" discs	£4.95
• **M85** – holds up to 95 5.25" discs	£6.95
• **M25*** – holds up to 25 3.5" discs	£4.95
• **M50** – holds 50 3.5" discs	£6.50
• **M10** – holds 8 of No. 10 Data Cartridges	£15

* Not lockable

Plastic Library Cases



Holds up to 10 3.5" Discs.	£1.50
Holds up to 10 5.25" Discs.	£2.00

Dust Covers (For our Disc Drives)

Single CLS (without PSU)	£3.20
Single CS (with PSU)	£3.25
Twin CLD (without PSU)	£3.85
Twin CD (with PSU)	£3.90

Disc Albums

Attractively finished in black leather-look vinyl. Stores up to 20 discs. Each disc can be seen through the clear view pocket.

£4

Special Bulk Offer on Discs

(Supplied packed in Anti-Static Lockable Storage Units)
(Lifetime warranty on Discs)

PRICES SLASHED

BULK PACK DISCS in lots of 100

Type	S-S 40T	D-S 40T	D-S 80T
• Without Sleeves 5.25"	£30	£35	£40
• With Sleeves 5.25"	£33	£38	£43
• 3.5" D/S D/D	£29 for 50	£52 for 100	

Quality Disc Drives from Watford

To help you decide which drive is the most suitable for your needs (and your pocket!), we have produced the table below. The tinting of the boxes indicates 40/80 track switchable disc drives. For ease of use, the switches are mounted on the front panel.

All our Disc Drives are Double Sided and will operate in both Single and Double Density modes. *Extensive experience of the usage of disc drives suggests that the JAPANESE drives currently represent about the best in terms of speed, reliability and overall "elegance" available for the BBC Micro.*

Various UK "manufacturers" of disc drives for the BBC micro (more accurately, "packagers" label other manufacturers drives with their own name). We buy the high qulity NEC and Mitsubishi drives in large quantities directly from the manufacturers, package them and sell them at "dealer" prices direct to the public.

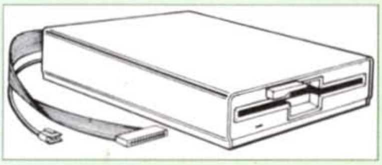
If you look around the popular BBC micro press, you will find that the prices we quote for the top quality, new slimline disc drives are, virtually without exception, some of the best around. These prices, coupled with the backup of one of the country's largest distributors of BBC peripherals provides a superb deal.

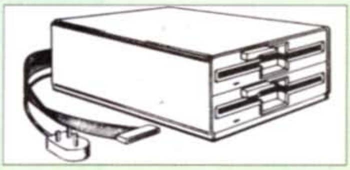
Unless you anticipate using dual drives in a fully expanded BBC system for long periods of time with little ventilation, then we suggest that our range of "CL" disc drives without the PSU (Power Supply Unit) would be quite adequate (extensive tests within our workshops have confirmed this). All drives are supplied complete with a SPECIAL UTILITIES Disc, Cables and Plugs. The Drives with power supply have a mains moulded plug for safety purposes. ***Ideal for Schools & Colleges.***

When using a BBC Micro, most people find themselves short of desk space. The Watford's BBC Micro plinths form an ideal way of recovering some of this precious space) your BBC Disc Drive and Monitor can all occupy the same vertical footprint and still be comfortably situated. With the Watford Double plinth, your Disc Drive is mounted vertically at one side, leaving a very valuable area directly in front of you for such useful items as spare discs, pen, paper, reference manuals, etc. Follow the trend with a Watford plinth. (Turn to the 4th page of our advert for the Plinths).

P.S. All our 5.25" Disc Drives with PSU are compatible with the Compact Micro. All you require is the special Compact Disc Drive Cables designed by us.

Our Disc Drives conform to BS415





"Test Bureau Approved for Use in Education"

Capacity	Drives without P.S.U.		Drives with P.S.U.	
	Single	Twin	Single	Twin
400K (720K)	CLS 400S £72		CS 400S £82	
800K (1,44M		CLD 800S £142		CD 800S £159
• TWIN Disc Drive Case, complete with Power Supply & Cables **£43** **Securicor carriage on Disc Drives £6 to £7**				

Prefix ***C** = Cased Drive*
***L** = Less PSU*
***S** = Single*
***D** = Double*

Suffix ***S** = 40-80 Switchable*

e.g. *CLS400S = Cased Disc Drive, Less power supply unit, single 5.25" 400K, (720K in double density); Double sided; 40/80 track switchable.*

Refurbished Disc Drives now available
CLS400 £50; CLD800 £98; CS400 £59; CD800

Special Cable to connect both 3.5" and 5.25" Disc Drives simultaneously to the BBC Compact £13

Special 40/80 Disc Drive/DDFS Mk II Offer

- The popular 40/80 track 400K single Disc Drive, Double Sided, cased with Cables. Plugs directly to your Micro.
- Watford's extremely popular DDFS Disc Interface (allows 720K storage). Will run in both Single & Double Density modes.
- A comprehensive User Friendly Manual.

A Bargain at Only **£119** (£7 carr) (Offer valid while stocks last)

3.5" DISC DRIVE OFFER

These top quality 3.5" Double sided, 80 track, 1 Megabyte (unformatted each Disc Drives), are attractively finished in BBC beige. They are supplied complete with all cables and a Utilities Disc.

Drives to connect to BBC Micros own PSU

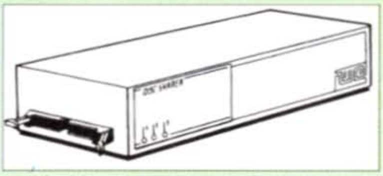
- **CLS35 400K Unit £62**
- **CLD35 Twin 800K £109**

Drives with built-in Power Supply Unit

- **CS35 Single 400K £84**
- **CD35 Twin 800K £126**

(P.S. CS35 Single is supplied in a twin case with a blanking plate to enable easy expansion to a dual drive at a later stage).

DISC DRIVE SHARER

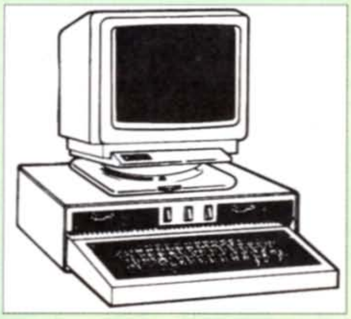


(Ideal for educational establishments)

At last, a low cost alternative to the Econet system.Watford's Intelligent Disc Drive Sharer allows you to connect 3 BBC micros (model B, B+ and Master series) to a single or double disc drive. Running under any DFS or DDFS, this intelligent unit will automatically queue the computers. Each computer has a status light dedicated to it. If it is green you will get immediate access to the disk, and red means that you are next in line. The unit plugs directly into the disc drive socket on each computer and is powered by the mains. (N.B. Not for use with ADFS.)

Price includes 3 Cables Offer Price : **£55**

CDPM 800S DP35-800S



Twin 800K Double sided 40-80 track switchable disc drives mounted in an attractively finished Beige colour plinth for the BBC Micro. Supplied complete with integral power supply, cables and Utilities disc. The mains switch with neon On/Off light indicator, and the two 40/80 track switches are mounted on the front panel for ease of use.

CDPM 800S for the BBC B & Master £165

A Double disc drive with a difference! Times are changing fast for the floppy disk, and whilst the current standard for the BBC B and Master series is the 5.25" disk, the standard of the future will most certainly be the smaller; faster and more reliable 3.5 inch disks – now a standard feature of both the Master Compact and the Archimedes Series.

To support the present disc drive users, and cope with the future, we have designed our own plinth-mounted disk system – called the DP35 800S. It contains both the 5.25 inch and the 3.5 inch drive formats as well as offer a firm and rigid support for a monitor on top. With the BBC Micro underneath, the plinth makes a surprisingly small footprint on the desk – leaving you more space to work with.

The 5.25" disc drive is 40/80 track switchable. DP35-800S has its own power supply, independent of the BBC Micro.

DP35-800S for BBC/Master £154

(Securicor Carr. £7)

(The above drive units are 2 Megabytes unformatted)

Continued→ → → → → → → → →

QUEST MOUSE Mk II

• Quest Mouse II & Quest Paint	£58
• Quest Mouse II, Quest Paint, AMX Stop Press & Pagefont	£89
• Quest Mouse II only	£29
• Quest Paint Software only	£34
• Quest Font Disc (22 Text Fonts)	£15
• Quest Mouse Mat (Red or Blue or Green please specify)	£3
• Quest Colour Dump Disc – This new software allows you to print direct from Quest Paint to your Integrex Colour Printer	£18

(P.S. Quest Paint is not compatible with BBC Compact)

Quest Paint is the winner of the BBC Acorn User 1990 Award for the Best Art/Graphics software

ConQuest

Quest combined with ConQuest and Acornsoft GXR ROM make up THE MOST POWERFUL drawing packages available for the BBC range. Quest Paint is able to take advantage of almost any additions to your machine, such as Shadow or Sideways RAM. ConQuest takes this principal even further, by utilising the otherwise normally incompatible Sideways RAM facility by holding pictures in them.

ConQuest ROM Package £30

(Price includes software in ROM and a comprehensive Manual).

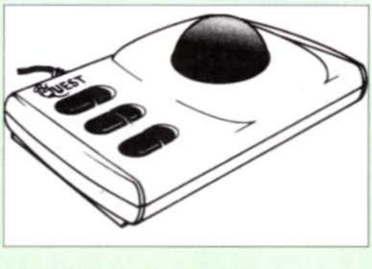
(Not Compatible with BBC Compact)

ARCHI Mk II MOUSE

An extremely reliable replacement mouse for Archimedes Micro £39

QUEST – Tracer ball

An attractively finished, extremely reliable, mouse replacement, input device. Requires very little desk space. Connects directly to your BBC B, BBC Master or Archimedes Micro.



QT-10	BBC/Master Version	**£32**
QT-20	Archimedes Version	**£35**

RB2 Marconi TRACKER BALL

RB2 (AMX/Quest compatible)	£45
RB2 including Quest Paint	£75
RB2-A for Archimedes	£46

THE NEW Mk III AMX MOUSE

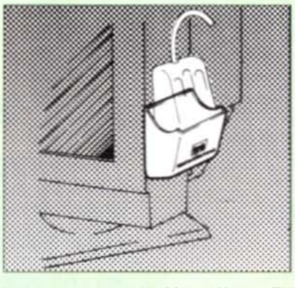
Inc. Super Art package

ONLY: £59 (carr £3)

(Please specify for BBC, Master or Compact)

MOUSE MAT	£3
AMX MOUSE ONLY	£29
AMX SUPERART Package	£34
AMX STOP PRESS – A Desktop publishing software. Works with Keyboard, Joystick or a mouse	£32
PAGE-FONTS – Over 20 Fonts for use with AMX Pagemaker	£13
AMX DESIGN (ROM)	£55
AMX XAM Educational	£15
AMX EXTRA EXTRA	£16
AMX MAX A gem of desktop (ROM)	£20

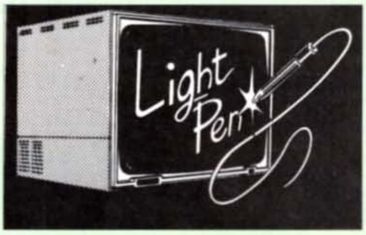
WE Mouse House



Treat your mouse to a cosy Mouse House. This handy little gadget solves the problem of where to store your mouse when it is having a rest. Made of sturdy plastic, the WE Mouse House attaches to the side of your computer, monitor, disc drive or desk.

It protects it from damage when not in use, yet within easy reach when you need it again. There is also a second compartment for your pens and pencils – and at £4 it doesn't cost a rodent's ransom.

Price £4



Our Mark II Light Pen is the very latest in light pen technology. It is totally insensitive to local lighting conditions and works with many different monitors. The pen only responds to the High Frequency light produced by your monitor/TV. An LED indicates when valid video data is being produced. A conveniently located switch is also fitted. (Price includes FREE software Disc and Operating Manual)

Only £21

FLEET STREET EDITOR

Software pack for BBC Micro	£33
Software pack for the Master	£39
Admin Xtra Disc Utility	£13
Fonts N Graphics Disc Utility	£13

BEEB VIDEO DIGITISER

"Test Bureau Approved for Use in Education"

Using any source of composite video (colour or monochrome) and the Watford Beeb Video Digitiser, you can convert an image from your camera into a graphics screen on the BBC Micro. This uses the full graphics capacity of the BBC micro in modes 0, 1 or 2. The video source may be a camera, video recorder or television, and is connected via the video output socket. The software supplied includes a sophisticated, fast screen dump routine.

Images produced can be compressed, stored to disc, printed on an Epson compatible printer, directly used to generate graphics, analysed for scientific and educational use or converted to other formats e.g. Slow Scan TV or receiving a picture from a remote camera using a modem. The output from the digitiser exactly matches the graphics capability in each mode, with up to 8 levels of grey in mode 2. The unit connects into the User Port and automatically scans a complete picture in 1.6 seconds.

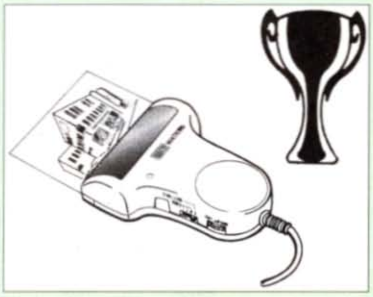
£109 (Carr. £5)

(BBC B+ and Master compatible, except Master with Econet)

(Price includes) Digitiser Unit, Software in ROM & a Comprehensive Manual)

The Beeb HandScan

Hand-held Scanner for the BBC Micro



Watford Electronics are pleased to announce the launch of the first hand held scanner for the BBC Micro. HandScan is a compact unit which will allow photographs, diagrams, or any other documents to be digitised quickly and easily, to then be used in a desk top publishing package, art program, or even in your own Basic programs! These useful devices have been available for faster and more expensive micros for some time, but only now is Watford Electronics able to offer the BBC Micro computer.

The HandScan plugs directly into the 1MHz bus on the BBC while a comprehensive set of utilities provided by the sophisticated ROM firmware. The scanner has a resolution of either 100 DPI or 200 DPI when accuracy is essential. Pictures as wide as 4" may be scanned in mode 0 and various types of dithering may be selected to simulate the grey levels of a scanned picture.

All necessary software has been included in the firmware to allow the scanner to read images directly into our Wapping Editor with little more than the click of the mouse. The digitised picture may then be incorporated into your magazine, newsletter, report or any other document.

Beeb HandScan & Firmware **£135**

WAPPING
EDITOR
"MIGHTIER THAN THE QUILL"

Winner of the BBC Acorn User 1990 Award for the Best DTP/Word Processor

The Wapping Editor

The Wapping Editor from Watford Electronics represents a breakthrough in Desktop Publishing for the Beeb. The package includes a 64K ROM containing ALL the software needed to get into print fast; a very sophisticated graphics module, professional quality typesetting software, a word processor, a comprehensive font editor for designing your own typefaces, and a variety of printer dumps. This mouse-driven system is designed for the BBC B, the B+ and Master computers and will take full advantage of any Sideways and Shadow RAM that may be fitted. It will run under DFS, ADFS and Network filing systems and requires as a minimum just a single 40 track drive.

Included with the system is a utility disc containing several high quality fonts, various utilities and a ROM image of a Support ROM. A comprehensive 100 page manual completes the package. The Support ROM contains routines to allow an area to be rotated to any angle or distorted to any four-sided shape. Also included are facilities to draw ellipses at any angle and sectors, segments and arcs (in Master or BBC B with Acorn GXR). Another of the features of the Support ROM is a 'Turbo DFS' which gives DFS access times comparable with those of ADFS.

Page Layout Section

The Wapping Editor may be used to create pages of any size from an A6 to a full A3 page. If none of the eight default page types suit your purpose, the stand-alone page creation program may be used to create pages to your own requirements. By using proportionally spaced fonts and genuine microspacing it is possible to print over 150 characters across an A4 page. A unique feature of the Wapping Editor is the 'A5 x 2' page size allowing two A5 pages to be printed side by side onto a single A4 sheet.

The graphics module incorporates the facilities like: pencil, brush, airbrush, polygon, circle, eclipse, fill, cut & paste, etc.

Text may be typeset, either justified or unjustified, in any font anywhere on the page. Simply select which font and text document you wish to use, and pull out a rectangle on the page where you want the text to be – it's as simple as that! Multiple columns may be printed just as easily and a special 'expand' feature may be used to expand the microspacing so that the document exactly fits the space defined.

Word-Processor

The integral word processor is the ideal tool for producing your text documents, although text can of course be read in from any of the other popular word processors such as View, Wordwise etc.

The Font Editor

The font editor module will allow you to design your own typefaces or to modify the ones provided on the utility disc. This sophisticated editor has numerous functions designed to take the tedium and frustration out of producing good looking, well balanced fonts. Each character may be individully proportionally spaced and characters of any size up to 16 x 16 pixels may be defined.
Pictures may also be 'grabbed' from a video source by using the Watford BEEB Video Digitiser.

Wapping Editor Software Pack	**£69**
Wapping Editor plus Mouse	**£89**

(Wapping Editor only works with Master Compact if a Mertec Expansion box is fitted)

NEW

At the request of many of our customers we are now able to offer training in the use of Wapping Editor DTP package. For further information please telephone 0923 37774 and ask for Tim or Shiraz

Wapping Art Disc

Over 250K of clip art to cut and paste into your Wapping Editor pages. Pictures include maps, transport, people, media, sport, games etc.
Two 'ratio' screens for use with hi-res and rotated A5 pages to ensure images are not distorted when printed out.

Music writing symbols in the form of pattern and brush for quick production of manuscripts are included together with staves.

There are two prepared hi-res pages layed out for printing labels, both single and double width. Ready made label designs are included but these can be easily replaced with your own designs.

A Mode 0 screen dump routine is also included. To pack such a large amount of data onto the discs the screens have been compressed and routines to compress and expand Mode 0 screens are included on both discs. Using the packing routine you can archive large numbers of screens onto a single disc.

£15

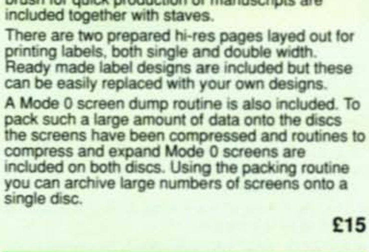
Wapping Font Disc 1

Sixteen additional fonts, including smaller version of Oberon and Daisy and two new sizes of the standard font for the Wapping editor.
Also included are three Mode 0 screens containing giant 'headline' fonts to cut and paste to create extra smooth headlines.
Supplied complete with instructions. **£12**

Wapping Font Disc 2

This new addition to our Wapping range of DTP software provides you with additional 23 fonts for the Wapping Editor DTP pack. (80 track discs only). **£13**

Laser Direct



By using the power of the Archimedes RISC processor, it offers the best of both worlds – print speed up to 5 times faster than typical Laserjet compatibles – uses outline fonts so that any font can be scaled to any size – works with all programs that use RISC OS printer drivers. Ideal for use with Genesis, !Draw, Acorn DTP, Impression, etc. Includes 50 sheet paper tray and a single sheet/envelope tray. Requires one expansion slot and at least a 2Mbyte Archimedes. A very compact printer, a very low initial cost and very low running costs.

Special Price: £849

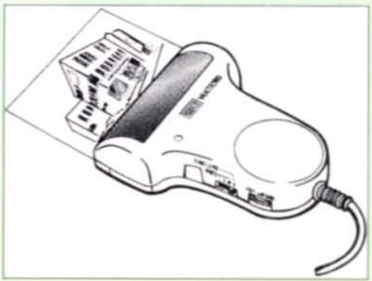
High Res Laser Direct Card for Canon LPB4 Laser Printer	£325
LPB4 Printer plus Card	£1025

(For demonstration, call in at our retail shop)

CREDIT CARD 24 HOUR
Ansaphone Hot Lines
(0923) 50234 or 33383

All prices are exclusive of VAT

Archi Mk II Hand Scanner



Watford Electronics is now able to offer a complete hand held scanning package, possibly the most essential addition to any desk top publishing system, for only £149. The package includes the most comprehensive utility software available for the Archimedes, a high quality hand held scanner, and all necessary documentation to get you going straight away.

SCANNER

The scanner is capable of scanning up to an amazing 400 dots per inch (DPI)! The scanning area is 4" wide, and the height is only limited by the maximum amount of memory available. The dot resolution may be switched to 100, 200, 300 or the maximum 400 dpi. One of four operating modes may be selected offering either pure monochrome scanning, or one of three grey level modes. The grey level modes use different size dither patterns to represent up to 16 shades of grey. There is also a dial to allow the "brightness" to be adjusted over a wide range, in order to optimise the quality for any specific image. The scanner interface is a standard, single width, expansion card (podule) which plugs into the Archimedes' backplane. The socket on the rear panel connects the scanner by 1.8 metres of cable.

SCANNER SOFTWARE

Full use is made of the windowing and the multi-tasking facilities of RiscOS. The software is supplied in a 64Kbyte ROM located on the interface board. The scanner appears as a small icon on the desktop icon bar, and the software is retrieved from the ROM simply by clicking on that icon. As you scan a page, the image appears in the scanning window on the screen, scrolling up in real time. The other facilities included in the software are.

Cropping and scaling to any size including stretching and squashing in X and Y direction separately.

Colour tinting.
X and Y flip.

Edge detection which turns solid objects into outlines.

Selective directional copying which allows features (i.e. lines or text) to be made thicker or thinner.

Scanned images may be saved as sprite files or transferred directly into other RiscOS applications (DTP, Draw, Paint) simply by dragging the sprite file into the application's window. Sprites may also be generated using anti-aliasing. This greatly improves picture quality and is particularly effective when scanning material with a range of grey tones, such as photographs. Images can be printed on any printer that is supported by a RiscOS printer driver, with optional settings for portrait or landscape modes, image scale and positioning. Images are printed using the full resolution of the printer and are not limited to the screen resolution.

On-screen help is provided via the RiscOS interactive help facility. Calls are also provided in the ROM for users wishing to write their own software, incorporating the use of the scanner.

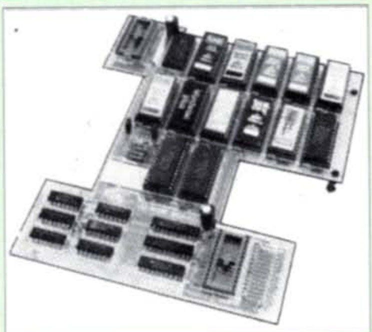
AHS-4 Archi 300/400 Version	**£149**
AHS-3 Archi A3000 Version	**£175**

Continued→ → → → → → → → →

STAFF VACANCIES

Watford Electronics is the leading supplier in the Acorn computer field and has established itself in the PC compatible market with its Aries PC computers. In its eighteen year history, Watford has always kept itself at the forefront of the new technology. Due to our latest expansion, we require staff to man our BBC/Archimedes and PC Technical Departments. Applicants will be required to be familiar with BBC/Archimedes hardware and software, and PC staff will need to be familiar with PC computer hardware. Good rates of pay, excellent prospects. Subsidised company accomodation is available to single persons if required. Telephone Keith Archer or Richard Overfield for interview, or write to us enclosing your CV.

Solderless Sideways ROM Socket Board



The key features of this new, no fuss, easy to install quality product from BBC leaders Watford Electronics are as follows:

- Increase your BBCs capacity for ROMs from 4 to 16.
- **No soldering required.**
- Very low power consumption.
- Minimal space required.
- Compatible with Torch, DDFS, RAM Card, 2nd Processor, etc.
- Socket 14 takes two 6264 RAM chips.
- Read protect to make RAM "Vanish") allows recovery from ROM crashes.
- Battery backup option for RAM chips.
- Supplied ready to fit with comprehensive instructions.

Price: Only £35
Battery Backup fitted **£39**
Battery Backup only **£3**
16K Sideways RAM **£8.50**
(carriage £3)

- Sideways RAM Utilities Disc for Solderless ROM Board. Includes the options to load and save ROM Images and the facility to use Sideways RAM as Printer Buffer.

Only: £8

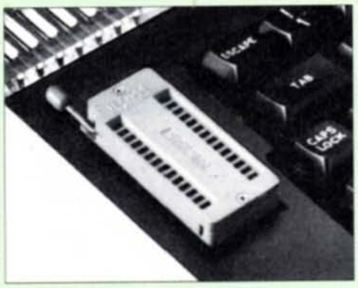
User Port Splitter Unit

User Port Splitter
A
B

Gone are the days when you had to plug and unplug devices from the User Port. This extremely useful little device allows two units to be connected to the User Port simultaneously, and select between them simply by toggling a switch. This device is particularly useful for those people using Quest Mouse and the Watford Video Digitiser or any similar combination

Excellent Value at **£22** (carr £2)

Sideways ROM ZIF Socket System



Allows you to change your ROMs quickly and efficiently, without opening the lid. The ZERO INSERTION FORCE (ZIF) socket is located into the ROM Cartridge's position.

- Very simple to install. NO SOLDERING required. The ZIF (Zero Insertion Force) eliminates the possibility of damage to your ROM pins when inserting & extracting.
- The low profile of the socket allows unrestricted access to the Keyboard.
- All data and address lines are correctly terminated to ensure correct operation of suitable ROMs with the BBC micro. We also supply a purpose designed see-through storage container with anti-static lining, allowing you to store up to 12 ROMs, protecting them from mechanical and static damage.
- This versatile hardware solves the problem of running out of socket space. Simply lift the ROM from the ZIF & insert a different one (No pulling or pushing of Cartridges. It is a must for professionals and Hobbyists alike.)
- BBC, B and B+ compatible.

ONLY **£18** (carr £3)

BBC B Low Profile Cartridge System

Complete System consists of: Low profile ROM Cartridge, Socket housing, Cable assembly, 5 labels and a library storage rack for the BBC B.

• Complete System	£11
• Spare Cartridges	£2.75
• Spare Rack	£1.65

ROM Cartridges for the BBC Master

Will accept the new larger PIggy Back ROMs like: Interword, Interbase, Quest, Conquest, etc

Twin **£9;** Quad **£14**

16K Disc Ram Module

(16K Sideways RAM Module)

Complete with such features as read and write protection, these new modules from Watford Electronics are ideal for the hobbyist, software developer and ROM collector.
Key points to note about this new addition to the Watford range of products are:

- Write protection (useful in a variety of circumstances)
- Compact construction
- No overheating or overloading problems.
- Free utilities disc supplied
- Can be used as a 16K PRINTER BUFFER.
- Ideal for profressional software development.
- Supplied with utilities software disc.

Only: **£29** (carr £2)

Optional Battery back-up fitted £3

ARIES CORNER

B-32 Shadow RAM Card

Like the BBC B+, the B32 provides 20k of shadow screen RAM and 12k of sideways RAM. Unlike the B+, the B32 has simple software commands which allow the user to reconfigure the RAM as 16k of shadow RAM and 16k of sideways RAM, or all 32k as sideways RAM.

With the B32, the programmer gets up to 28k of RAM available for Basic, Logo, Cobal, Forth, Lisp and BCPL programs in any screen mode. The business user gets extra memory for View, ViewSheet, Wordwise Plus, Interword and many other applications. For advanced applications, the scientific user gets access to a massive 47k of data storage using the Acorn approved ★FX call.

Sideways RAM enables you to load sideways ROM images from disc, allowing you to have a large library of sideways ROMs (subject to the copyright holder's permission) stored on disc. The B32's sideways RAM can also be used to extend any operating system buffer (such as th printer buffer) or to load tape programs into a disc system.

The B32 simply plugs into the 6502 processor socket on you BBC micro – no flying leads to connect and no soldering. Provision of the onboard ROM socket means that the Aries-B32 control ROM does not use up one of your existing ROM sockets.

- Recommended by Computer Concepts for use with their Inter series of ROMs.

Price: **£69** (carr. £3)

Aries B-12 Sideways ROM Board

The B-12 provides a total of twelve sideways ROM sockets (the four in the original machine are replaced by the twelve on the board), all fully accessible by the MOS sideways ROM system. In addition, there are two sockets for sideways RAM, giving up to 16k of RAM using 6264 static RAM chips.

If you do not have a B32 or B20, a small adaptor module (the Aries-B12C) is available at a nominal cost

Price:	Aries B-12	£36
	Aries B-12C	£5

Aries B-488 IEEE-488 Interface Unit

The Aries-B488 is an interface unit to enable the BBC micro to control and monitor IEEE-488 bus systems. The IEEE-488 bus (also known as the 'GPIB or 'HP IB') is the standard method of interconnecting programmable laboratory instruments and control equipment. Using the B488, up to 15 devices may be connected in a single high-speed data network.

£238 (Carr £3)

Voltmace Joysticks

Delta 3B Single Joystick	£10
Delta 3B Twin Joysticks	£15
Delta 3C Joystick for Compact	£10
Delta 14B Single Joystick	£11
Delta 14B/1 Adaptor Module	£12
Transfer Software Disc-Tape	£7
Delta-Cat A mouse eliminator Joystick for the Archimedes	£24

Delta Base B

Analogue aircraft style yoke Joystick to run in the analogue port of the BBC B & Master 128 £25

ROM/RAM Card

Watford Electronics announced the first ever commercial ROM board for the BBC micro, the Watford Electronics 13 ROM Socket Board 7 years ago. Following the success of this board, we have designed what probably represents the ultimate in expansion boards, the new Watford Electronics ROM/RAM board. This highly versatile and sophisticated board represents the latest in "2nd generation" sideways ROM technology for the BBC micro, designed to satisfy the serious BBC user.

- NO SOLDERING required to fit the board.
- NO User Port corruption (avoids problems with the mouse, modems, Eprom Programmers, etc.)
- Fully buffered for peace of mind.
- Compatible with BBC micros (not BBC+ or Master).
- Total number of ROMs increased from 4 to 8.
- Up to 8 banks of sideways RAM (dynamic).
- Option for 16k of battery backed CMOS RAM (CMOS RAM needs one ROM socket).
- Software Write protect for ALL RAM.
- Read protect for CMOS RAM (ALLEVIATES crashes during ROM development).
- Separate RAM write register (&FF30 to &FF3F).
- Automatic write to currently selected RAM socket for convenience.
- FREE utilities disc packed with software.
- Compatible with our DDFS board, 32k RAM Card, Delta Card, sideways ZIF, etc.
- Large printer buffer.
- UNIQUE fully implemented RAM FILING SYSTEM (similar to the popular Watford DFS).
- ROM to RAM load and save facilities.

The SFS (Silicon Filing System) can utilise up to the full 128k of RAM (with the SFS in any paged RAM) as a SILICON DISC. This behaves as a disc drive, with all the normal Watford DFS features (including OSWORD &7F for ROMSPELL, etc.) to provide an environment that looks like a disc but loads and saves MUCH faster.

The ROM-RAM Board plugs into the 6502 CPU socket. This leaves free all the existing ROM sockets, which can still be used normally.

Any ROM that can be plugged into the BBC micro's own ROM sockets may be used in the ROM-RAM Board.

The ROM-RAM Board is supplied with all ordered options fitted as standard. Upgrade kits (with full instructions) are available for all of the options, for later.

PRICES:

• ROM/RAM card with 32k dynamic RAM	**£48**
• ROM/RAM card with 64k dynamic RAM	**£65**
• ROM/RAM card with a massive 128k dynamic RAM	**£109**

(carriage on ROM-RAM Card £3)

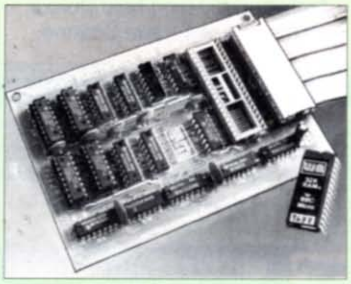
OPTIONAL EXTRAS:

• 16k plug-in Static RAM kit	£9
• 16k Dynamic RAM for Upgrade	£13
• Battery backup	£3
• Read and Write protect switches	£2 each
Complete ROM-RAM board All options installed	£115

P.S.

IS your existing ROM Board overflowing with ROMs? Do you need more Sideways RAM? Is your Board unreliable? Then upgrade to Watford, ROM/RAM Board and pay £5 less.

32K Shadow RAM/Printer Buffer Card Expansion Board



A MUST FOR WORD PROCESSING

Don't throw away your BBC B for a BBC B Plus or BBC Master. Just plug the ribbon cable into the 6502 processor socket, and fit the compact board inside the computer. Immediately you will gain not 16k or even 20k, but a massive 32k of extra RAM!!!

- IMPROVE your WORD PROCESSING system, whether disc or cassette based. Don't wait for a slow printer – type in text while printing. TWO JOBS DONE SIMULTANEOUSLY and £100+ saved on a printer buffer.
- "VIEW" Wordprocessor users can now type in letters in 80 columns and have up to 28,000 bytes free – 5 times as much as normal.
- In WORDWISE (or WORDWISE-PLUS), preview in 80 columns with the full 24k of text in memory. This product is recommended as an ideal complement by Computer Concepts.
- Combine GOOD GRAPHICS and LONG PROGRAMS. Use the top 20k of the expansion RAM as the screen display memory, leaving all the standard BBC RAM free for programs. Benefit from MODE 0/1/2 graphics and 28k of program space.
- Use the FULL 32k or the bottom 12k of the expansion RAM as a PRINTER buffer for PARALLEL or SERIAL printers, sound channels, RS432 etc. Print large text files while running long graphics programs, and have all your buffer options available as well (*FX15,21,138, 145,ADVAL etc). Please note only a 12k printer buffer can be used with Wordwise or Wordwise-Plus, due to the way they are written.
- Unique facility to turn ROMs off and on again. Unlike all other ROM managers, this feature does not use 'unofficial' memory. Two bytes of normally user-inaccessible memory on the RAM card are used to ensure ROMs are disabled WHERE OTHER ROMS FAIL.

Only £59 (carr £3)

(Price includes a comprehensive manual and the ROM)

BBC SOFTWARE'S Popular Educational Software

• Maths with a Story 1 (Disc). 4 primary level maths programs	£11.25
• Maths with a Story 2 (Disc). 4 further maths programs.	£11.25
• Picture Craft (Disc) 6-14 age group. Pack consists of flexible geometrical design & colouring programs.	£17.00
• ECOLOGY O-Level program.	£20.00
• POLYMERS O-Level program.	£20.00
• Classification & Periodic Table O-Level. The suite is supplied with its own database of chemical elements which can be classified according to your own rule.	£20.00
• ADVANCED TELETEXT SYSTEM	£8.65
• PERIOD TABLE SOFTWARE	£20.00
• Computers at Work – Primary	£17.35
• Introducing Geography 11-17 years	£17.50
• Electric Fields 6-14 years	£11.25
• Espana Viva – 3 Discs	£19.95
• WHITE KNIGHT Chess game	£16.00
• A Vous La France	£29.00

More Educational Software

• **FUN SCHOOL 2 – Red:** Under 6 yrs – 8 programs on Discs, Shape Snap, Find the Mole, Teddy Count, Write a Letter, Colour Train, Pick a Letter, Spell a Word & Teddy Bears Picnic.	**£12.00**
• **FUN SCHOOL 2 – Green:** 6-8 yrs – Eight programs on Disc, Number Train, Shopping, Maths Maze, Treasure Hunt, Bounce, Packing Caterpillar, 3 Number jump	**£12.25**
• **FUN SCHOOL 2 – Blue:** Over 8 yrs – Eight programs on Disc, Build a Bridge, Passage of Guardians, Unicorn, Logic Doors, Souvenirs, Code Boxes, Mystery Machine & Escape.	**£12.50**
• **FUN SCHOOL 3 – Red**	**£19.95**
• **FUN SCHOOL 3 – Green**	**£19.95**
• **FUN SCHOOL 3 – Blue**	**£19.95**
• Six French Games – Aimed at pupils in their first year of French, but also useful as revision for more advanced students 11 years+	£26
• More French Games – Another 6 games 12 years+	£26
• Au Restaurant and Accident de Route 12 years+	£26
• Boulogne and Oh-Les – 2 programs for beginners	£26
• Letters to French Penpals – 11 years+	£26
• French Programs with Henri Beret – The programs in this series present vocabulary, grammar and role-play phrases in the form of animated games. 11-16	£22
• Six German Games – Aimed at pupils in their first year, but useful as revision for more advanced student of German. 12 years+	£22
• More German Games – Aimed at pupils in their 2nd year of learning German. 12 years+	£22
• The Cloze Program – Using context clues to predict is much more than a gap filling exercise. All ages	£26
• An Introduction to Electronics – Brings together all the basic electronics required for a GCSE Physics or CDT course. 14-16 years	£26
• Computer Control – This is a package of 3 programs simulating control of a greenhouse, a robotic arm & a chemical plant. 14-16 years	£26
• The Nuclear Reactor – An interactive, menu driven program for GCSE pupils. Demonstrates & explains nuclear fission & the chain reaction. 14-16 years	£22
• PUNCMAN Learning punctuation	
Puncman 1 & 2 for 7 – 13 years	£15
Puncman 3 & 4 for 8 – 14 years	£15
Puncman 5 & 6 for 8 – 15 years	£15
• Yes Chancellor – A chance to take over number 11 at Downing Street. 12 years+	£18
• Letters & Pictures – Introduces phonic skills to Infants 6-8 years	£15
• Numbers & Pictures – Early number learning is a great fun (4-6 years)	£15
• Note Invaders – Budding musicians can learn the notes on the Clef with this elegant game 3 programs (7 to Adults)	£15
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Wordwise plus £40

We are giving away absolutely **FREE,** the superb Word-Aid ROM worth £24, with every WORDWISE PLUS package bought from us.

Word-Aid

The most comprehensive utilities ROM for Wordwise-Plus

Extend the power of your Wordwise Plus word processor with this most advanced ROM from Watford. By utilising the powerful Wordwise Plus programming language, WordAid provides a whole host of extra features, all accessed via a special new menu option. This ROM has been personally approved by Mr Charles Moir, the author of WORDWISE PLUS.

- Alphabetical sorting of names and addresses.
- Text transfer options.
- Chapter marker.
- Epson printer codes function key option.
- Search and display in preview mode.
- Embedded command removal.
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- Multiple file options for print and preview.
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- Label printer.
- Mail-merger.
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- Clear test-segment area.
- BBC B, B+ and Master compatible.

Only **£24**

(N.B. Word Aid requires a Disc interface in your Micro)

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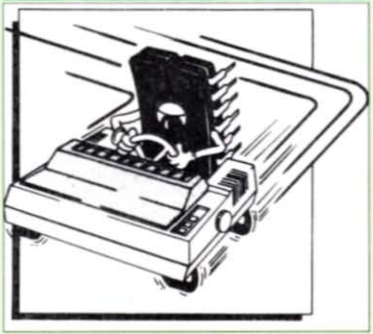
(When ordering please specify for which Micro & 40 or 80 track Disc)

CREDIT CARD 24 HOUR Ansaphone Hot Lines (0923) 50234 or 33383

VIEW PRINTER DRIVER ROM



View is a powerful word processor, but until now has seriously lacked in terms of printer support. With the launch of our Printer Driver ROM, which includes an extremely powerful and easy to use Printer Driver Generator, View users can find themselves in the realms of advanced word processing at only a small outlay.

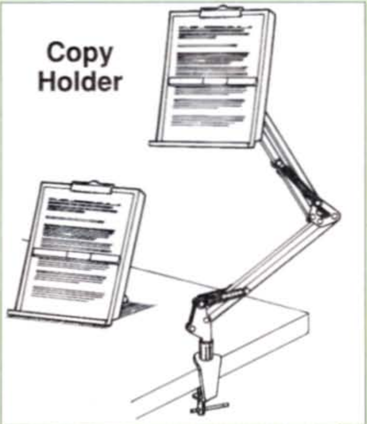
The VPD extends View's printer command with a series of mnemonic commands. All standard highlight sequences are also supported. A large range of printers are supported by drivers contained within the ROM (the drivers can be downloaded and customised). Printers supported include: Epson's MX, RX, FX, LX, JX80 range, HI80, KP810/910, PW1080, JP101, HR15, M1009, GLP, Panasonic KX-P1081/2, JUKI 6100, etc.

Other printers are readily supported by defining a Printer Driver using the built-in Printer Driver Generator. The features mentioned below are available to both the built in Printer Drivers and user defined drivers (assuming the printer supports the features).

NLQ control, Underline, Bold, Proportional Spacing, Microspacing, Italic, Superscript, Subscript, Condensed, Enlarged, Double Strike, Set lines per inch numerically (e.g. LPI 6), Set characters per inch numerically (e.g. CPI 5), Select printer font, Select printer ribbon colour, Translation sequences, Emulation of BBC Character Set, Simple numeric expressions for certain operations, Full printer setup, Send control codes, Print prompt on screen, Redifinable Pad character, Pause for key press, Prompt to change daisywheel, and Execute ★ command when printing.

Other features include a very powerful on-screen preview, with bold, italic, underline, super/subscript, enlarged highlights, and a special printer driver to allow memory-based text to be previewed by View 1.4. Of course, View 1.4, 2.1 and 3.0 are all supported, as is Shadow RAM and 6502 Second Processors. The BBC B series and Master series of micros are supported. A comprehensive manual is supplied. All in all, a very professional product for the discerning user who wants power at their finger tips.

Price: Only £33



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Office Master

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Although Acorn machines (such as the BBC B, the Master, the Archimedes and the BBC A3000) are mainly used in education, most commercial computers use other operating systems, particularly MS-DOS. As a result school computer users are at a disadvantage when moving into 'business' computing. PCs and other commercial computers use MS-DOS as the operating system, so commands for formatting, copying, backing up, printing and the modem are not the same. Even file names are written differently! And did you know that there is one Acorn command which, if used in MS-DOS, wipes everything in the current directory?

'ACORN TO PC' enables you to change over painlessly. It shows clearly and quicly how, why and where the two systems (Acorn and MS-DOS) differ. As with a foreign language dictionary, you can use the book to transfer either way – from Acorn to MS-DOS, or from MS-DOS to Acorn.

'ACORN TO PC' also acts as a handy reference guide to all Acorn star commands and their MS-DOS equivalents. It also has an extensive and readable explanation of the directory tree and heirarchical filing systems in general. Both DFS and ADFS Acorn systems are covered.

'ACORN TO PC' is written clearly and concisely by Dr. John Lockley, who has wide experience of writing and broadcasting. He is currently appearing as a regular contributor on Radio 5, and is co-author of 'The Complete BBC Computer User Handbook'.

Price: £15.95

The Complete BBC Computer User Handbook

"Why has no-one written a book like this before? It's long overdue".

If you own a BBC-B, BBC B+, Electron, Master 128, Master Compact or Archimedes then this book is for you. It shows you how to get the most from your computer, and how to make the computer work for you. Although some sections are machine specific, most of the information, programs, hints and good solid experience are for the whole range of BBC machines. The general style and level means that both beginner and expert will feel satisfied with the quality and quantity of the material.

GENERAL – Uses and abuses of computers.

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Beeb PC (BASIC) automates many of these changes, and will convert majority of BBC statements that are invalid for IBM BASIC into equivalent acceptable statements. In addition BBC BASIC data files can be converted to IBM BASIC format, with support provided for all BBC data formats:- INTEGER, REAL & STRING.

Price: £38

Beeb DOS 3.0

(Now reads Archimedes Discs)

The BBC and IBM PC's are the most popular micros in the UK. The BBC is firmly established in the education sector and the IBM is the industry standard in the business world. The pools of information and applications held on these computers are immense, yet the means of passing information between them are very limited. Beeb DOS provides a practical method of transferring information between these two micros.

Beeb DOS is a collection of utilities which run on the PC's and enable it to read and write information on BBC discs. You can transfer files between your PC's 360K floppy, high density floppy or hard disc and your BBC discs. In addition Beeb DOS allows you to catalogue, format and compact BBC discs and delete, re-name, lock and unlock BBC files, all on PC's. Each Beeb DOS utility is written in IBM assembler and is run directly from PC or MS-DOS. The Beeb DOS utility can be run from floppy disc, hard disc or RAM drive.

Beeb DOS is supplied on an IBM 5.25", 360K disc complete with a comprehensive operating manual.
(Will only work on 360K Disk Drives)

Price: £39

(Please write in for technical literature)

The Complete Mouse User Guide to BBC Micro

This manual has been written to reveal the secrets of the mouse. It explains all the principles required by the hardware and associated software, and also example listings for inclusion into custom programs. The manual first details the basic principles of the mouse and a simple program which uses these principles. This information should be adequate for most applications. However, it is possible to improve the performance of the mouse by expanding on the principles already used in the software. This is again fully explained and an example program given.
It is possible to gain a full understanding of the mouse from this manual. For those not interested in exactly how the mouse functions, complete example programs are also included. These may be typed directly into the micro, without the need for any understanding of the hardware or software involved, enabling the mouse to be used for custom applications.

Price £5.95 (No VAT)

Example programs on Disc £4.95

Continued→ → → → → →

Acorn Speech Synthesizer package complete, for the BBC B Microcomputer

Special Offer £18

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- Panasonic Premier Dealer
- Roland Plotter Official Dealer
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ADDER

The only low cost EPROM Programmer for the BBC Micro that will program both the standard 21V and the new 12V5, 27128 EPROMS.
The Adder unit connects to the User Port and draws its power from there too. The EPROM is mounted in a top quality ZIF socket. There are no switches or controls as Adder is entirely software controlled.
The Adder software provides sophisticated facilities for programming EPROMs from a RAM image produced by loading disc files. The software is menu driven and designed for ease of use.

Features:

- Two ultra fast programming algorithms or standard slow algorithm.
- Supports standard 21V programming and newer 12.5 volt EPROMs. (Software switched).
- The RAM image to be programmed can be built up in many ways. Sections of image can be loaded separately. Part programming. Read EPROM. Edit data in memory.
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- Works with all standard filing systems. Generates header code for RFS ROMs to allow Basic programs etc. to be stored in EPROM. More than one file per ROM permitted.
- Programs the following EPROMs: 2516, 2716, 2532, 2732, 2764, 27128, & 27256.

£65 (£5 Carr)

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Watch this space for our forthcoming new products for the Archimedes Micro

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This king size multipurpose foam cleaner spray is ideal for cleaning Keyboard, Monitor, Disc Drive & Computer furniture surfaces.

£2.50

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Ideal for cleaning and preventing static build-up on TV/Monitor Screens.

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Ideal for removing dust & dirt from Keyboard & similar inaccessible spaces. **£3**

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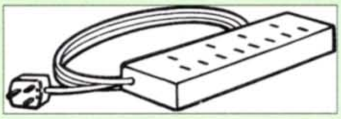
Fitted in place of your normal mains plug, this device protects your equipment (and data from corruption), against mains high voltage translent spikes/surges caused by lightening or thermostats switching.

Protection for only **£8.50**

4 Way Mains Distribution Socket



4 way top quality mains trailing sockets.
Supplied wired up with mains plug ready for use.
Can be screwed to floor or wall if required.
Very useful for tidying up all the mains leads from your peripherals.

£9.50

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A 4 way mains distribution unit as above with a built-in Surge Arrester, providing protection for your complete Computer/Hi-Fi System

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This extremely useful tool allows you trouble free chip insertion and removal from your computer by distributing the removal force over the whole body of any 24 or 28 pin chip. **£2**

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28pin DIL Header Plug

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£14

Watford POWER DUCK £8

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4464-12	**£7.50**
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74LS244	**£1.00**
74LS245	**£1.00**
74ALS245	**£2.75**
74LS373	**£1.00**
74LS393	**£1.00**
75453	**£1.00**
75159	**£3.00**
9637	**£2.00**
ICL7673PA	**£3.00**

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Acorn BCPL	**£42**
ACORN DNFS	**£17**
Acorn FORTH	**£32**
Acorn Graphics	**£25**
Acornsoft C Disc	**£36**
Acorn LISP	**£19**
Acorn OS B+	**£25**
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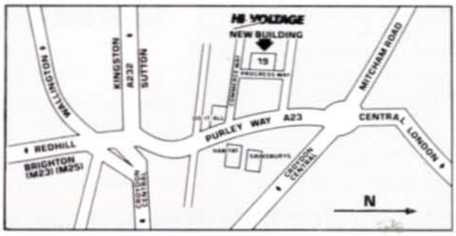
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What's bugging you?

Stephen Ramplin holds out a helping hand in the first of a new series on error handling

NO program of any length, developed from scratch or copied from a magazine, will be completely free of bugs. Fortunately the Basic rom provides help with its error messages which indicate what the error is and the line being processed when it occurred – but not necessarily the line containing the fault.

And even when your program seems to be completely free of bugs when run, problems can still occur from misuse.

Take a division program which requires someone to input the numbers. If an attempt is made to divide by zero, execution terminates with the error *Division by zero at line xxxx*. This can be prevented by a simple data check before the division operation.

Listing I shows a division program illustrating the ideas involved. When RUN it prompts you for the dividend, the number you're dividing into, and the divisor, the number you're dividing by.

It checks for a zero divisor and also verifies that the data which has been input are numbers. This prevents the problems caused by typing the word *twelve*, for example.

The crux of the program is the function *FNinput*. This inputs a number as a text string which it converts character by character to the number itself. If the conversion fails the string contained a letter, in which case you are informed of your error and asked to input the number again. The check for the zero divisor is performed outside the function just before the actual division operation. With little extra effort your programs can be made foolproof.

Basic errors

There are a few errors you may stumble across due to bugs in early versions of the Basic Rom. In Basic I, INSTR doesn't work if the second string is longer than the first. Indeed this bug will cause a fatal crash from within a procedure. Also:

```
PRINT -ABS(1)
```

produces the error *Type mismatch*.

Another problem to watch out for is backward compatability. Commands such as OSCLI are only found in Basic from version II onwards. Only early BBC Micros have Basic I, and to discover if yours is one of them enter *BASIC then REPORT. A copyright date of 1981 indicates Basic I.

Errors vary from simple, easily rectified problems to faults which can only be solved by clever debugging techniques.

Many error messages indicate errors which more than likely occur in the line stated, or as a result of a specific operation – as listed in the panel on the next page. It may seem a strange thing to say, but sometimes Basic reports an error in a line which is perfectly correct. The actual error is located elsewhere, and has merely had an effect in the line indicated.

The errors in Table II are quite easy to solve, especially after a little practice, but careful reading of the error description in the User Guide will shed a lot of light.

A good technique for tracking down an error's location within a multistatement line involves splitting the line into smaller ones. Take this example:

```
100 PRINTTAB (10,1)"Press
SPACE":REPEATUNTILGET=32
```

When RUN, the error message *No such variable at line 100* occurs. To find which section of line 100 contains the error split it at the colon, into two lines

```
100 PRINTTAB (10,1)"Press SPACE"
105 REPEATUNTILGET=32
```

Once again line 100 is the culprit but now the statement containing the error has been isolated. Line splitting is very useful for isolating the offending part in long multistatement lines. The error here is the space between TAB and the opening bracket – there mustn't be one. In this case Basic tries to find a variable called TAB, fails and so generates an error.

Error handling

As long as you can actually see the error message there is a sporting chance you can find the problem. But try this:

```
MODE5:COLOUR129:COLOUR1:CLS
```

You should now be seeing red. Try

➤

> *'... problems can still occur from misuse'*

Common problems when typing in programs

- Brackets: These are easily missed, so check there are an equal number of each.
- Quotes: Also easily missed. Ensure there are an even number in each line. Avoid confusion between a double apostrophe and a quote.
- Punctuation: Problems here will be evident from a corrupted screen display. Check commas and semicolons, which are often confused.
- Lines: Check you haven't accidently joined two lines or split a line in two, which could well cause problems. Keep an eye out for similar lines close together – your eyes could skip from one to another.
- Seeing double: Take care with similar characters: It is quite easy to confuse capital O with zero, lower case L or capital I with one, and figure six with capital G.
- Data: Check and recheck data lines, use checksums if possible.

➤

pressing a few keys at random, followed by Return: No error message. Well, an error probably has occurred, but it has been printed in red on a red background – not particularly helpful. Imagine the same thing has happened with your arcade extravaganza – the error could be almost anything.

An error handler is required to overcome this problem. When an error occurs Basic usually prints up the error message in the current colours, mode and so on. With ON ERROR you can make Basic respond to an error differently by calling your own routine.

For instance, the line ON ERROR PROCerror would force execution to jump to DEF PROCerror when an error occurred, which is very useful. Listing II demonstrates an error handler which changes mode, reports the error and lists the culprit line with those before and after it.

Listing I

```
   10 REM Division Program
   20 REM By Stephen Ramplin
   30 REM (c) The Micro User
   40 ON ERROR MODE7:REPORT:PRINT" at li
ne ";ERL:END
   50 MODE135
   60 VDU23;8202;0;0;0;
   70 REPEAT
   80 CLS
   90 PRINT'"Enter all numbers as figure
s, not words"'
  100 dividend=FNinput("Enter Dividend")
:ans%=FALSE:REPEAT
  110 divisor=FNinput("Enter Divisor")
  120 IFdivisor=0 THENPRINT'"Can't divid
e by zero!" ELSEPRINT'"The Answer to ";d
ividend;"/";divisor;" is ";dividend/divi
sor:ans%=TRUE
  130 UNTILans%=TRUE:PRINT'"Another Go (
Y/N)?":REPEAT:*FX15,1
  140 A$=CHR$(GET AND&DF):UNTILINSTR("YN
",A$)>0
  150 IFA$="Y" THEN UNTIL0 ELSE UNTIL-1
  160 END
  170 DEFFNinput(message$)
  180 REPEAT:PRINTmessage$;":";:INPUT;""
figure$:C%=1:accept%=TRUE:REPEAT
  190 asc%=ASC(MID$(figure$,C%,1)):IFasc
%<ASC"0"OR asc%>ASC"9" PRINT'"Include Nu
mbers Only":accept%=FALSE:C%=LENfigure$
  200 C%=C%+1:UNTILC%>=LENfigure$:UNTILa
ccept%=TRUE
  210 =VAL(figure$)
```

```
  10 =    0 0      120 = A9C9 1
  20 =    0 0      130 = E7A3 9
  30 =    0 0      140 = 2BDA 8
  40 = BC2B B      150 =   2F E
  50 = 5E50 4      160 = FD2E E
  60 = F716 E      170 = 9699 A
  70 = BFBA 2      180 = CC5F 3
  80 = 7A16 5      190 = 3FC1 E
  90 = F924 3      200 = 4063 A
 100 = F1ED C      210 = 742D B
 110 = 8E11 5
```

> “No program of any length developed from scratch or copied from a magazine will be completely free of bugs”

More complex errors are easier to solve when the program section is on the screen and can be referred to.

If, when you RUN it, everything hangs up you have entered an error into the error handling procedure. When it is encountered the procedure calls itself, encounters the error again, calls itself and so on. In otherwords an endless loop is entered, giving the impression of a crash. The ON ERROR OFF command can help here if necessary.

The error handler uses the commands REPORT and ERL. REPORT prints the error message on the screen and ERL returns the line number of the line in which the error came to light.

The procedure changes mode using VDU22 – MODE commands are not allowed in procedures, except when using the 6502 second processor or Basic 5 on an Archimedes or BBC A3000. It then prints up the error message.

The lines are listed by putting the line numbers of the first and last lines of the block into function key zero, which is then executed.

When using the procedure in your own programs you must supply three parameters in brackets after the PROCerror command. The first is the mode to be selected, the second the number of lines previous to the error line which are listed, and the last is the number of lines listed after the error line.

The ON ERROR command may be followed by any of the usual Basic programming commands. For example:

```
200 ON ERROR IFERR=17 RUN ELSE PROCerror
```

allowing complex responses to errors. The example line introduces another error-associated command, ERR. This is a function returning the error number of the last error. All errors are uniquely identified by an error number.

Here ERR=17 (Escape) is tested for, and if found the program RUNs again, otherwise the error handler is called.

Some programs use ON ERROR to disable error reporting. While this may be useful for trapping Escape, testing for a specific error is better programming practice. Error numbers are listed in the User Guide.

● *Next month we'll take a further look at debugging techniques.*

Errors most likely to occur in the line stated

Bad Call, Bad command, Bad DIM, Bad MODE, Bad Program, Block?, Channel, Data?, DIM space, EOF, Escape, Failed at line ...., File?, FOR variable, Header?, LINE space, Missing ,, Missing ", Missing), Missing #, Mistake, No Room, No such line, No TO, Not LOCAL, ON syntax, Silly, STOP, Syntax, Syntax Error, Type Mismatch.

Listing II

```
   10 REM Error Handler Demo
   20 REM By Stephen Ramplin
   30 REM (c) The Micro User
   40 ONERROR PROCerror(135,2,2):END
   50 MODE135
   60 VDU23;8202;0;0;0;
   70 REM Dont correct the next line
   80 Mistake
   90 END
  100 DEFPROCerror(mode%,back%,fwrd%)
  110 VDU22,mode%:IFback%<2 back%=2
  120 PRINT:REPORT:PRINT" at line ";ERL
  130 I%=PAGE:IFNOT(I%?1=ERL DIV256 ANDI
%?2=ERL MOD256) THENREPEAT:I%=I%+I%?3:UN
TIL(I%?1=ERL DIV256 ANDI%?2=ERL MOD256)
  140 J%=PAGE:DIMN%(back%-1):IFNOT(I%=J%
) THEN REPEAT:FORN%=0TOback%-2:N%(N%)=N%
(N%+1):NEXT:N%(back%-1)=J%?1*256+J%?2:J%
=J%+J%?3:UNTIL(I%=J%):L%=N%(0)
  150 C%=fwrd%:REPEAT:I%=I%+I%?3:C%=C%-1
:UNTILC%=FALSE ORI%?1=&FF:H%=I%?1*256+I%
?2:list$="KEY0 L."+STR$L%+","+STR$H%+"|M
":$&700=list$:X%=0:Y%=7:CALL&FFF7:*FX138
,0,128
  160 ENDPROC
```

```
  10 =    0 0       90 = FD2E E
  20 =    0 0      100 = 73E2 A
  30 =    0 0      110 = 2336 A
  40 = 57E9 9      120 =  499 E
  50 = 5E50 6      130 = FBD4 E
  60 = F716 4      140 = 4EA5 0
  70 =    0 4      150 = 6344 0
  80 = 1C44 1      160 = ED0F 7
```

Bombed – The Gate Part 2

Get set for a return match in Hell courtesy of David Hopkins

HAVING completed *The Gate* in record time as a member of the angel's brotherhood, you are carrying out your angelic duties when suddenly one of the angels cries out: "Has anyone seen my cross? I'm sure I had it yesterday, after Pearly Gate duty." One by one the angels realise, with horror, that theirs are missing too.

"Wait a sec", says God, "Mine's gone too. You know, the one I keep in the drawer next to my bed, with the lovely silver and gold carvings on it and 'A present from Jerusalem' written on the back.

"Oh no! They can't be down there. Hold on a minute. Yep I thought so, they're down in Hell, don't ask me how they got there, but they're there. So who is going down to get them back then?"

All eyes turn on you.

"Why me, guys?"

"Well you did complete The Gate with honours, didn't you?"

"Oh all right then, an angel has to do what an angel has to do. Where's my soul-sucker?"

"Ah yes, well, you see there was this nice little man who came round collecting for charity," says God. "And I was sure you wouldn't mind, I mean I could hardly say no, could I? And we're a bit short of any more of them, what with the foreign parts being such poor quality, you just can't get the standard needed nowadays..."

"OK, what can I use then?", you say with a sigh.

"Well these are just hot off the production line." He hands you some sticks with fuses. "They will destroy everything in the neighbourhood, so keep clear yourself. I will supply you with more as you go down the levels".

Then with a flick of His hand you appear once again in Hell.

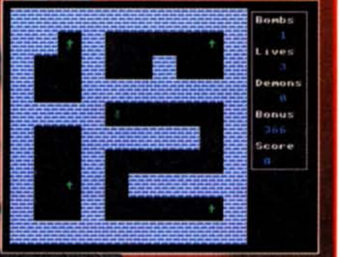
Each bomb you drop will destroy everything within one square radius, including walls, demons, crosses, traps, teleports and, of course, yourself. Make certain that you don't destroy crosses, as without them you will not be able to complete your present level.

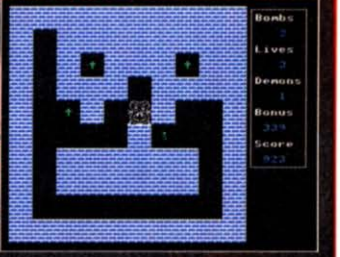
One bomb can be dropped at a time by pressing Return and can be detonated any time afterwards by pressing the spacebar.

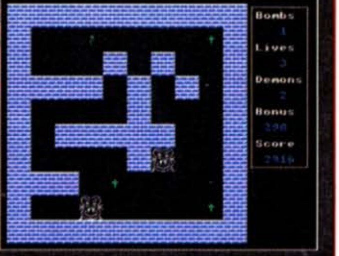
You can only have one bomb on the screen at a time. Use Z, X, *, / for left, right, up, and down respectively. If you ever become trapped, pressing Tab will cost you one life and reset the level.

On some levels you will encounter demons. They are very stupid and will

➤







➤ move directly towards you unless blocked by a wall. Touching them is lethal, but they can be destroyed by bombs.

Later levels house teleports and traps. Teleports simply move you to another specific square on the screen. These can be very useful if a demon is giving chase, but are not always beneficial.

Traps are set off when you leave a square with one in. It will create a wall, effectively blocking your way back.

You have three lives to complete all 15 levels, and a certain quota of bombs for each level.

The program consists of three listings. Type them in, check them with Get it Right! and save as Bombed, Bombed2 and Screens. To play simply run the first program, which will in turn load the others.

The Editor

Also supplied on the subscription disc is a screen definer. Simply CHAIN"EDIT" to run. Keys Z, X, * and / move the cursor, Return places the selected character at the cursor.

The up and down arrow keys selects the current character, and Tab finalises the edited screen after which you will be asked how many bombs are to be available.

There may be no more than eight crosses, three monsters, one teleport and eight traps. There must be one or more crosses and a starting place, and if a teleport is chosen, an arrival position must also be selected.

The editor creates a Basic program at &3000, consisting solely of data statements, which can be saved after 15 screens have been defined.

Listing I

```
   10 REM > Bombed
   20 REM by David Hopkins
   30 REM (C) The Micro User
   40 VDU23,224,0,0,7,24,32,32,64,64
   50 VDU23,230,0,0,0,0,64,0,8,128
   60 VDU23,231,0,32,8,32,20,64,16,128
   70 VDU23,225,1,0,0,0,0,0,0,0
   80 VDU23,226,0,7,31,63,127,127,255,255
   90 VDU23,227,2,199,254,252,252,252,25
4,254
  100 VDU23,228,255,255,255,127,127,63,3
1,7
  110 VDU23,229,254,254,254,252,252,248,
240,192
  120 ENVELOPE1,1,0,0,0,4,4,30,0,123,-1,
-1,126,126
  130 ENVELOPE2,1,0,2,4,3,2,8,0,127,-7,-
3,126,126
  140 ENVELOPE3,3,0,-1,-1,2,2,100,0,127,
-4,-2,126,126
  150 ENVELOPE4,1,0,3,-3,3,3,3,30,-2,-2,
-2,120,120
  160 MODE1:VDU23,1,0;0;0;0;
  170 DIML$(26),Q%256:z=0:P=FALSE
  180 RESTORE410:FORu%=1TO26:READL$(u%):
NEXT
  190 B$=CHR$5+CHR$18+CHR$0+CHR$1+CHR$22
6+CHR$227+CHR$10+CHR$8+CHR$8+CHR$228+CHR
$229+CHR$8+CHR$8+CHR$11+CHR$18+CHR$0+CHR
$2+CHR$224+CHR$225+CHR$4
  200 VDU19,1,4;0;19,2,6;0;
  210 PROCp("THE MICRO USER",150,900,12,
12,12)
  220 PROCp("PRESENTS",275,750,16,16,16)
  230 PROCp("BOMBED",100,600,32,32,32)
  240 PROCp("BY",600,400,8,8,8)
  250 PROCp("D HOPKINS",430,300,8,8,8)
  260 FORA=110TO1070STEP96:MOVEA,150:PRI
NTB$:NEXT
  270 REPEATGCOL3,3:FORA=174TO1134STEP96
:MOVEA,182:VDU5,230,4:NEXT:PROCW:FORA=17
4TO1134STEP96:MOVEA,182:VDU5,231,4:NEXT:
PROCW:UNTILINKEY$0<>""
  280 PROCVDUS:CLS
  290 F$="SCREENS":PRINTTAB(10,10)"Load
new screens?";
  300 IFINSTR("Yy",GET$)INPUT'"Filename:
"F$'
  310 *KEY0IFINKEY-256<>161:PAGE=&1100|M
LOAD"BOMBED2"|Mt$=" "+STR$~(TOP-2)|M*FX1
38,0,129|M
  320 PROCoscli("KEY1DIMX%256:Y%=X%DIV25
6:$X%=""LOAD "+F$+"""+t$:CALL&FFF7|MREN.
|MIFINKEY-256=161RUN|M*TAPE|MFORA%=0TOTO
P-PAGE STEP4:A%!&E00=A%!PAGE:N.|MPAGE=&E
00|MO.|MRUN|M")
  330 *FX138,0,128
  340 END
  350 DEFPROCp(b$,x%,y%,lx%,ly%,s%)FORA%
=1TOLEN(b$):z%=ASCMID$(b$,A%)-64:IF z%=-
32 z%=0
  360 IFLENL$(z%)=0 GOTO400
  370 S%=ASCMID$(L$(z%),1)-65:dx%=S%DIV5
:dy%=S%MOD5:MOVEx%+dx%*lx%,y%-dy%*ly%
  380 FORb%=2TO LENL$(z%):s$=MID$(L$(z%)
,b%,1)
  390 S%=ASCs$-65:dx%=S%DIV5:dy%=S%MOD5:
DRAWx%+dx%*lx%,y%-dy%*ly%:NEXT
  400 x%=x%+(lx%*5)+s%:NEXT:ENDPROC
  410 DATAEBFPVYWC,AETXRCRVPA,XTJDBFPV,A
PVXTEA,UACMCEY,UACMCE,VPFBDJTXWM,AECWUY,
FPKOJT,KUPSOJD,AECUCY,AEY,EAMUY,EAYU,XTJ
DBFPVX,ACAPVRCE,VXTSYSTJDBFPV,ACAPVRMYMC
E,UFBCWXTE,AUKO,ADJTXUY,ACOWU,AEMYU,AYMU
E,AMUMO,AUEY
  420 DEFPROCW:LOCALT%:T%=TIME+10:REPEAT
UNTILTIME>T%:ENDPROC
  430 DEFPROCVDUS
  440 VDU23,238,0,16,0,84,8,36,16,0,23,2
39,16,132,16,69,144,4,130,36,23,224,28,4
2,28,0,62,73,20,20,23,225,12,30,12,2,28,
2,2,6,23,226,12,30,12,2,28,0,20,18,23,22
7,28,42,28,34,73,20,20,16,23,228,28,42,2
8,34,73,20,20,4
  450 VDU23,229,28,62,28,34,73,20,20,4,2
3,230,28,62,28,34,73,20,20,16,23,231,12,
30,12,16,14,16,16,24,23,232,48,120,48,64
,56,0,40,72,23,233,24,24,126,126,24,24,2
4,24,23,235,0,126,24,24,24,24,24,0
  460 VDU23,240,7,24,22,33,32,33,33,17,2
3,241,0,231,24,128,97,6,64,194,23,242,22
4,24,8,100,132,4,132,136,23,243,8,202,41
,120,40,200,17,18,23,244,131,33,196,3,60
,231,102,66,23,245,144,19,84,158,20,19,1
36,72,23,246,34,36,19,17,40,52,35,224
  470 VDU23,247,66,0,0,165,102,24,129,12
6,23,248,68,36,200,136,20,44,196,7,23,25
4,4,8,2,1,253,254,252,0,0,23,255,0,251,2
51,170,0,191,191,170,23,253,129,0,0,0,0,
0,0,129
  480 ENDPROC
  490 DEFPROCoscli($Q%)LOCALX%,Y%:X%=Q%:
Y%=Q%DIV256:CALL&FFF7:ENDPROC
```

Listing II

```
   10 REM > Bombed2
   20 REM by David Hopkins
   30 REM (C) The Micro User
   40 ONERRORMODE7:REPORT:PRINT" at line
 ";ERL:END
   50 MODE7:VDU23,1,0;0;0;0;0;:PROCinst:
*FX15
   60 A=GET:M$=CHR$240+CHR$241+CHR$242+C
HR$10+CHR$8+CHR$8+CHR$8+CHR$243+CHR$244+
CHR$245+CHR$10+CHR$8+CHR$8+CHR$8+CHR$246
+CHR$247+CHR$248
   70 MODE1:VDU19,3,4;0;19,1,7;0;19,2,2;
0;23,1,0;0;0;0;0;:M%=0:B%=0
   80 BOMB%=0:BX%=0:BY%=0:CX%=0:CY%=0:MN
%=0:P%=0:PX%=0:PY%=0:MU%=0
   90 LIVE%=3:D%=FALSE:L%=0:SC%=0
  100 DIMS%(9,9),M$(4,1),E$(2),MX%(2),MY
%(2),M%(2),OMX%(2),OMY%(2)
  110 FORZ=0TO1:FORV%=1TO9:FORH%=1TO9:E$
(-Z+1)=E$(-Z+1)+CHR$(238+Z):NEXT:E$(-Z+1
)=E$(-Z+1)+CHR$10:FORH%=1TO9:E$(-Z+1)=E$
(-Z+1)+CHR$8:NEXT:NEXT:NEXT
  120 E$(2)=STRING$(9," ")+CHR$10+STRING
$(9,CHR$8)
  130 M$(0,0)=CHR$224:M$(0,1)=CHR$224:M$
(1,0)=CHR$229:M$(1,1)=CHR$230
  140 M$(2,0)=CHR$231:M$(2,1)=CHR$232:M$
(3,0)=CHR$227:M$(3,1)=CHR$228
  150 M$(4,0)=CHR$225:M$(4,1)=CHR$226
  160 E$(2)=STRING$(9,E$(2)):FORA=0TO2:E
$(A)=E$(A)+CHR$11:NEXT
  170 S$=CHR$255+CHR$255+CHR$255+CHR$10+
CHR$8+CHR$8+CHR$8+CHR$255+CHR$255+CHR$25
5+CHR$10+CHR$8+CHR$8+CHR$8+CHR$255+CHR$2
55+CHR$255
  180 REPEATBON%=400:CLS:COLOUR3:COLOUR1
29
  190 RESTORE(1090+L%*10):READE$:PROCcon
vert:FORa%=0TO9:FORb%=0TO9
  200 S%(b%,a%)=VALMID$(D$,a%*10+b%+1,1)
:IFS%(b%,a%)=1PRINTTAB(b%*3+1,a%*3+1)S$
  210 NEXT:NEXT:COLOUR128
  220 READC%:FORc=1TOC%:READCX%,CY%:S%(C
X%,CY%)=3:COLOUR2:PRINTTAB(CX%*3+2,CY%*3
+2);CHR$233:NEXT
  230 READBOMB%,X%,Y%
  240 READM%:MN%=M%:IFM%FORz=1TOM%:READM
X%(z-1),MY%(z-1):M%(z-1)=1:NEXT
  250 READT%:IFT%READTX%,TY%,AX%,AY%:S%(
TX%,TY%)=5:PRINTTAB(TX%*3+2,TY%*3+2);CHR
$235
  260 READP%:IFP%FORz=1TOP%:READPX%,PY%:
S%(PX%,PY%)=6:COLOUR3:PRINTTAB(PX%*3+2,P
Y%*3+2)CHR$253:NEXT
  270 F%=0:D%=0:B%=0:MU%=0:PROCin:PROCp(
2)
  280 TIM%=TIME:REPEATTT%=TIME+10:T%=T%+
1:OX%=X%:OY%=Y%:*FX21
  290 IFS%(X%,Y%)=5PROCp(0):X%=AX%:Y%=AY
%:PROCp(2)
  300 IFS%(X%,Y%-1)<>1IFINKEY-73D%=1:PRO
Cp(0):PROCf:Y%=Y%-1:PROCp(2)
  310 PROCcc
  320 IFS%(X%,Y%+1)<>1IFINKEY-105D%=3:PR
OCp(0):PROCf:Y%=Y%+1:PROCp(2)
  330 PROCcc
  340 IFS%(X%+1,Y%)<>1IFINKEY-67D%=2:PRO
Cp(0):PROCf:X%=X%+1:PROCp(2)
```

Get it right!

```
   10 =    0 0 | 100 = AB4D 1 | 190 = 971F 9 | 280 = 74C8 D |
   20 =    0 0 | 110 = A900 7 | 200 = 8DBB 4 | 290 = B2D1 2 |
   30 =    0 0 | 120 = 3975 D | 210 =  3C1 7 | 300 = B7DF 9 | 370 = 95C6 9 | 440 =  B7A B
   40 = FAD5 5 | 130 = 5D03 7 | 220 = 3A60 2 | 310 = 2678 E | 380 = 6E87 C | 450 = 3CE2 2
   50 =  184 F | 140 = 81AE C | 230 = 6DD3 C | 320 = 3C81 B | 390 = FD21 D | 460 = 719A A
   60 = A4C8 1 | 150 =  511 5 | 240 = A61D 9 | 330 = 5DEC C | 400 = CC12 F | 470 = A353 8
   70 = 59F9 6 | 160 = 2C0C 5 | 250 = 9B7E A | 340 = FD2E 1 | 410 = C5BE 1 | 480 = ED0F 5
   80 = C64A 1 | 170 = A565 9 | 260 =  6C5 6 | 350 = FE04 0 | 420 = 8234 2 | 490 = 99D1 E
   90 =  ECB 7 | 180 = 1CD4 E | 270 = 2165 8 | 360 = 7F69 1 | 430 = 9931 1 |
  350 PROCcc
  360 IFS%(X%-1,Y%)<>1IFINKEY-98D%=4:PRO
Cp(0):PROCf:X%=X%-1:PROCp(2)
  370 IFB%=0IFBOMB%>0IFINKEY-74PROCbombd
rop
  380 IFINKEY-970RBON%<1PROCdead
  390 IFB%=1COLOUR2:PROCdrawbomb
  400 IFB%=1IFINKEY-99PROCexplod
  410 PROCcc:BON%=400-((TIME-TIM%)DIV10)
:COLOUR3:PRINTTAB(33,16);BON%" ";
  420 IFT%=100:T%=0:PROCp(0):D%=0:PROCp(
2)
  430 IFMN%>0PROCmonsters
  440 REPEATUNTILTIME>TT%:UNTILC%=0ORD%=
TRUE
  450 IFC%=0L%=L%+1:COLOUR3:SC%=SC%+BON%
MOD10:BON%=BON%DIV10*10:REPEATSOUND&11,4
,50,5:BON%=BON%-10:SC%=SC%+10:PRINTTAB(3
3,16);BON%" ";TAB(33,20);SC%;:PROCW(2):U
NTILBON%<1
  460 IFD%=TRUE D%=FALSE
  470 UNTILL%=15ORLIVE%=0
  480 IFLIVE%=0CLS:COLOUR3:COLOUR129:PRO
Cend:A=GET:RUN
  490 CLS:COLOUR3:COLOUR129:PROCwin:*FX1
5
  500 A=GET:RUN
  510 DEFPROCbombdrop:S%(X%,Y%)=2:B%=1:B
OMB%=BOMB%-1:BX%=X%:BY%=Y%:PROCi:ENDPROC
  520 DEFPROCexplod:SOUND0,1,6,10:S%(BX%
-1,BY%)=0:S%(BX%+1,BY%)=0:S%(BX%,BY%-1)=
0:&%(BX%,BY%+1)=0:S%(BX%+1,BY%+1)=0:S%(B
X%+1,BY%-1)=0:S%(BX%-1,BY%-1)=0:S%(BX%-1
,BY%+1)=0
  530 COLOUR1:PRINTTAB(BX%*3-2,BY%*3-2)E
$(0):COLOUR3:PRINTTAB(BX%*3-2,BY%*3-2)E$
(1):IFM%<1GOTO560
  540 FORz=0TOMN%-1:PROCW(5):IFMX%(z)<BX
%+2IFMX%(z)>BX%-2IFMY%(z)>BY%-2IFMY%(z)<
BY%+2IFM%(z)=1M%(z)=0:M%=M%-1:SC%=SC%+25
  550 PROCi:NEXT
  560 PRINTTAB(BX%*3-2,BY%*3-2)E$(2):B%=
0:IFX%<BX%+2ANDX%>BX%-2ANDY%>BY%-2ANDY%<
BY%+2PROCdead
  570 PROCdefsur:ENDPROC
  580 DEFPROCW(T%)T%=TIME+T%:REPEATUNTIL
TIME>T%:ENDPROC
  590 DEFPROCdrawbomb:PRINTTAB(BX%*3+2,B
Y%*3+2)CHR$254:ENDPROC
  600 DEFPROCp(c%)COLOURc%:PRINTTAB(X%*3
+2,Y%*3+2)M$(D%,F%):ENDPROC
  610 DEFPROCf:F%=1-F%:T%=0
  620 IFS%(X%,Y%)=6 S%(X%,Y%)=1:SOUND0,1
,5,10:COLOUR3:PRINTTAB(X%*3+1,Y%*3+1)S$
  630 ENDPROC
  640 DEFPROCdefsur:FORz=0TO9:S%(z,0)=1:
S%(z,9)=1:S%(0,z)=1:S%(9,z)=1:NEXT:PROCr
im:ENDPROC
  650 DEFPROCrim:COLOUR3:COLOUR129:FORA=
0TO9:PRINTTAB(A*3+1,1)S$;TAB(A*3+1,28)S$
;TAB(1,A*3+1)S$;TAB(28,A*3+1)S$:NEXT:COL
OUR128:ENDPROC
  660 DEFPROCcoin:SOUND3,1,150,1:S%(X%,Y
%)=0:C%=C%-1:SC%=SC%+50:ENDPROC
  670 DEFPROCmonsters:MU%=MU%+1:IFMU%>MN
% MU%=1
  680 z=MU%-1:IFM%(z)=0 GOTO770
  690 OMX%(z)=MX%(z):OMY%(z)=MY%(z)
  700 IFY%<MY%(z)IFS%(MX%(z),MY%(z)-1)<>
1 MY%(z)=MY%(z)-1
  710 IFY%>MY%(z)IFS%(MX%(z),MY%(z)+1)<>
1 MY%(z)=MY%(z)+1
  720 IFX%>MX%(z)IFS%(MX%(z)+1,MY%(z))<>
1 MX%(z)=MX%(z)+1
  730 IFX%<MX%(z)IFS%(MX%(z)-1,MY%(z))<>
1 MX%(z)=MX%(z)-1
  740 IFOMX%(z)<>MX%(z)OROMY%(z)<>MY%(z)
:COLOUR0:PRINTTAB(OMX%(z)*3+1,OMY%(z)*3+
1);M$:PROCc
  750 COLOUR1:PRINTTAB(MX%(z)*3+1,MY%(z)
*3+1);M$
  760 IFMX%(z)=X%IFMY%(z)=Y% PROCdead
  770 ENDPROC
  780 DEFPROCconvert:D$="":FORA=1TO20:B%
=ASCMID$(E$,A)-65:Q%=32:FORz=1TO5:Q%=Q%/
2:IFB%>Q%-1B%=B%-Q%:D$=D$+"1":ELSED$=D$+
"0"
  790 NEXT:NEXT:ENDPROC
  800 DEFPROCdead:COLOUR1:PRINTTAB(10,15
)"You are dead!!":SOUND2,3,150,1:FORm=1T
01000:NEXT:LIVE%=LIVE%-1:D%=TRUE:ENDPROC
  810 DEFPROCi:COLOUR3:PRINTTAB(35,4);BO
MB%;" "TAB(35,8);LIVE%TAB(35,12);M%TAB(3
3,16);BON%;" "TAB(33,20);SC%:ENDPROC
  820 DEFPROCin:GCOL0,1:MOVE1008,976:DRA
W1232,976:DRAW1232,336:DRAW1008,336:DRAW
1008,976:COLOUR1:PRINTTAB(32,2)"Bombs";T
AB(32,6)"Lives ";TAB(32,10)"Demons";TAB(
32,14)"Bonus";TAB(32,18)"Score";:PROCi:E
NDPROC
  830 DEFPROCend:PROCletter(5,5,"THE")
  840 PROCletter(5,15,"END"):*FX15
  850 PROCs:ENDPROC
  860 DEFPROCletter(LX%,LY%,I$)
  870 FORP%=LX%TOLX%+LENI$*8-8STEP8
  880 PRINTTAB(P%,LY%);
  890 LOC%=&C100+(ASCMID$(I$,1+(P%-LX%)/
8)-64)*8
  900 FORID%=0TO7:BP%=LOC%?ID%:NUM%=128
  910 FORTI%=0TO7:IFBP%>(NUM%-1)BP%=BP%-
NUM%:VDU255:ELSEVDU9
  920 NUM%=NUM%/2:NEXT:VDU10,8,8,8,8,8,8
,8,8:NEXT:NEXT:ENDPROC
  930 DEFPROCwin:PROCletter(3,5,"WELL")
  940 PROCletter(3,15,"DONE"):*FX15
  950 PROCs:ENDPROC
  960 DEFPROCc:LOCALJ%,K%,L%:J%=S%(OMX%(
z),OMY%(z)):IFJ%=0ENDPROC
  970 K%=OMX%(z)*3+2:L%=OMY%(z)*3+2:IFJ%
=3COLOUR2:PRINTTAB(K%,L%)CHR$233:ENDPROC
:ELSEIFJ%=5COLOUR1:PRINTTAB(K%,L%)CHR$23
5:ENDPROC:ELSEIFJ%=6COLOUR3:PRINTTAB(K%,
L%)CHR$253:ENDPROC
  980 DEFPROCcc:IFS%(X%,Y%)=3PROCcoin:PR
OCi
  990 ENDPROC
 1000 DEFPROCs:SC%=SC%+LIVE%*300:COLOUR1
:COLOUR128:PRINTTAB(6,25)"Your final sco
re was ";SC%;:ENDPROC
 1010 DEFPROCinst
 1020 PRINTTAB(14,0)CHR$141CHR$131"Bombe
d"TAB(14,1)CHR$141CHR$131"Bombed"TAB(15,
2)CHR$146"```````"TAB(12,4)CHR$131"By D.H
opkins"TAB(12,5)CHR$146"`````````````"
 1030 FORZ=7TO18:PRINTTAB(0,Z)CHR$129:NE
XT
 1040 PRINTTAB(5,7)"Being trapped in hel
l with nothing"'CHR$9"but a few sticks o
f dynamite you must"'CHR$9"collect all o
f the crosses to progress"'CHR$9"to deep
er levels. Your task would be"'CHR$9"eas
y but for the complex pattern of"
 1050 PRINTCHR$9"demons, teleports, trap
s and obscure"'CHR$9"positioning of cros
ses. You have three"'CHR$9"lives to coll
ect all the crosses on the"CHR$9"fifteen
 levels. Your wits, and reflexes"CHR$9"m
ust be at their best to complete the"
 1060 PRINTCHR$9"devious puzzles."'CHR$9
SPC6"GOOD LUCK (you'll need it)"
 1070 PRINTTAB(12,21)CHR$131"Press any k
ey"TAB(12,22)CHR$146"```````````````"
 1080 ENDPROC
```

Get it right!

```
  10 =    0 0 | 190 = 84DC 3 | 370 = A9E5 E | 550 = B102 B | 730 =  7A2 5 |  910 = 35C0 0
  20 =    0 0 | 200 = EB38 6 | 380 = 68D9 7 | 560 =  455 0 | 740 = 249C C |  920 = F549 3
  30 =    0 0 | 210 = A4CE 8 | 390 = 5ADA A | 570 = F4C2 D | 750 = FF0A E |  930 = 9BB5 4
  40 = 36FD D | 220 = F0F4 E | 400 = 6600 F | 580 = 32E6 0 | 760 = E636 6 |  940 = FCA1 4
  50 = BA57 6 | 230 = 1536 8 | 410 = AF7F B | 590 = E063 3 | 770 = ED0F 6 |  950 = F42C A
  60 = 817C 9 | 240 = AEB5 5 | 420 = 736D 1 | 600 = A257 A | 780 = A0B3 2 |  960 = 26BE 1
  70 = 3709 F | 250 = 5BBD 4 | 430 = A6D0 4 | 610 = 4C4A 1 | 790 = BB05 6 |  970 = 8098 3
  80 = 1A54 3 | 260 = 4C4E 9 | 440 = 498B F | 620 = AF40 6 | 800 =  BBE 8 |  980 = ED04 F
  90 = EE5B 2 | 270 = 8D86 C | 450 = 61A1 F | 630 = ED0F 3 | 810 = FAA0 D |  990 = ED0F 2
 100 = 8CA4 7 | 280 = E25C A | 460 = 745F C | 640 = 3679 E | 820 = E787 6 | 1000 = C6D0 6
 110 = 8851 2 | 290 = 17CA D | 470 = 96FC 3 | 650 = ED81 1 | 830 = 2754 9 | 1010 = D8F4 4
 120 = 241F 8 | 300 = 530E 3 | 480 = 3253 A | 660 = 7CD3 D | 840 = E821 3 | 1020 = 93C5 7
 130 = 630B E | 310 = 8F8E E | 490 = 1934 7 | 670 = AE2A 4 | 850 = F42C 0 | 1030 = 769C B
 140 = A017 7 | 320 = 52A1 9 | 500 = 6C52 9 | 680 = 4362 A | 860 = 491A F | 1040 = 806F 0
 150 = CA3E 1 | 330 = 8F8E F | 510 = 67E6 C | 690 = 6553 7 | 870 = B17D 8 | 1050 = 7D38 D
 160 = F342 A | 340 = 78AD D | 520 = BF0E A | 700 = E49C E | 880 = AC7B 3 | 1060 = 1065 F
 170 = CAB2 D | 350 = 8F8E 6 | 530 = 4544 8 | 710 = 7318 F | 890 = A589 7 | 1070 = EAEF 0
 180 = 6924 D | 360 = 2605 B | 540 =  72D 1 | 720 = EEC1 7 | 900 = ABDF 3 | 1080 = ED0F
```

Listing III

```
   1 DATA``[BSJT`_BT^SBS`SB``,4,2,1,8,1
,2,7,8,8,1,4,4,0,0,0
   2 DATA``X`V\XPSJQRX^X^QB``,3,3,2,7,2
,2,4,2,5,8,1,4,5,0,0
   3 DATA``UBVFUVRVVVVVVVUR``,2,1,1,8,8
,1,8,5,1,1,7,0,0
   4 DATA``QBX^UFVFWVUFR`QB``,6,1,1,8,1
,8,6,8,8,6,8,4,8,1,3,4,1,3,6,0,0
   5 DATA``SBZJVFUNTBY^SBQB``,4,1,1,1,3
,1,7,8,8,1,6,3,1,2,1,0,0
   6 DATA``QBRJ_VQRXZQR]BQB``,3,8,1,8,8
,4,7,1,1,1,2,1,8,6,6,0,0
   7 DATA``QB`^QBVLSVQFXVQB``,4,3,4,5,4
,7,4,8,5,2,2,1,3,2,3,2,8,3,8,0,0
   8 DATA``VFVFX^QBX^VFVFTF``,6,1,1,3,2
,6,1,3,7,6,7,5,8,1,8,5,1,1,5,0,0
   9 DATA``TZXNW^RRRRRRRQB``,4,4,3,5,2
,1,6,8,6,1,4,8,2,2,1,7,1,0,0
  10 DATA``UBVJWFX`QBX^VVQB``,4,4,3,8,3
,8,5,3,7,0,4,8,1,7,2,1,6,7,6,3,0
  11 DATA``RRX^URXXQRXXYBTB``,7,6,1,8,3
,8,5,5,8,1,8,1,6,4,3,2,8,7,1,3,1,1,7,7,3
,3,0
  12 DATA``SBZ```QD_`SRSRSR``,7,1,1,7,1
,8,1,8,8,8,7,1,8,1,7,3,4,4,3,1,4,7,4,4,8
,1,4,5,4,1,0
  13 DATA``QRRJSLWLSJ[NSJSJ``,6,7,2,7,8
,8,8,5,8,4,8,2,8,1,1,1,1,5,2,0,4,5,3,5,4
,4,6,4,7
  14 DATA``QBV`QBVLRJXWUFUJ``,6,1,8,8,1
,8,3,8,8,6,7,3,8,2,1,1,0,0,9,2,1,1,2,5,1
,7,1,6,3,1,4,3,4,7,5,8,7
  15 DATA``UFUVXXWDQ`WRSRUR``,9,4,4,4,5
,8,1,8,2,8,7,7,8,6,7,2,7,3,1,1,1,1,1,3,8
,0,8,5,1,5,4,3,5,6,6,8,6,8,8,6,8,7,7
```

```
 1 = 6705 5 |  9 = 81B7 8
 2 = 26C9 7 | 10 = 2A02 E
 3 = 1BF8 B | 11 = DC95 5
 4 = 1070 1 | 12 = FE50 0
 5 = EC0C 9 | 13 = 8759 A
 6 = BCE9 4 | 14 = B6BE 6
 7 =  5AE B | 15 = 5047 1
 8 = F2CD C |
```

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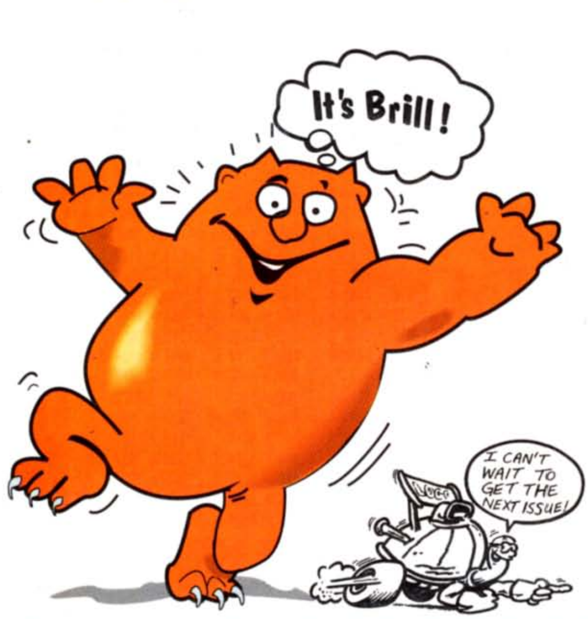
It's Brill!
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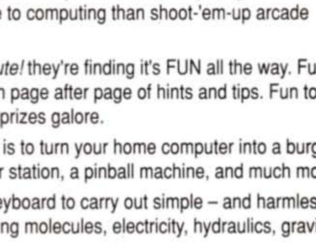

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Wonderful way with words

Steve Bruntlett lets himself go and flows his ideas into an exciting new mould

POSTER is a program which allows you to treat text like putty which can be squeezed, stretched and distorted into almost any two dimensional shape to produce quite wonderful graphics.

Produced by 4Mation and following the same high quality tradition of Snippet and Craftshop 1 & 2, it consists of the Poster program, borders, moulds, paths and two starter fonts.

The second disc contains an extra 18 fancy fonts and a number of additional borders filling the disc to capacity. It also has a third disc crammed full of line art and moulds costing an extra £24 – which is well worth the extra for the fonts alone.

The line art disc includes symbols, typographic spots, bullets, animals, labels and a complete set of illuminated letters with a range of backgrounds with which to produce your own illuminated alphabet.

If you'd like a free demonstration disc send 4Mation a blank formatted 3.5in disc with a SAE.

The manual provides useful information and there is a helpful set of appendices dealing with the production of your own Moulds and Borders, printer drivers, as well as a trouble shooting section. The dark blue cover does, however, make it difficult to read the very helpful list of keyboard shortcuts on the back cover.

The set of eight A4 poster worksheets are very good apart from one or two minor inconsistencies in some of the keyboard shortcuts and references to the discs.

Some details must have changed in development, but if the worksheets are to be used in schools they must be accurate. I assume that these have been produced with the National Curriculum in mind. It might be a good idea to supply them on an extra disc so that teachers can print or modify them to suit their needs.

The program's structure is similar to that of !Draw, but is greatly extended. If you are used to !Draw you'll recognise the menus and controls. What Poster does is to increase their range to include symbols on the top left hand corner denoting grouped or tagged objects or single column objects in a text area.

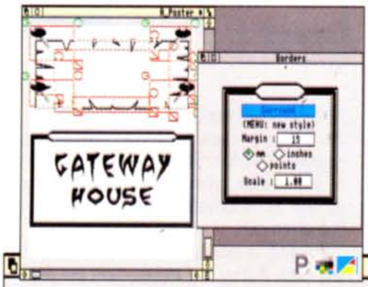
Tagging is a control process used by the path and mould facilities – symbols in the bottom left hand corner denote path and mould text objects, whether the mould is full or empty or whether the object is a border.

Easy to follow

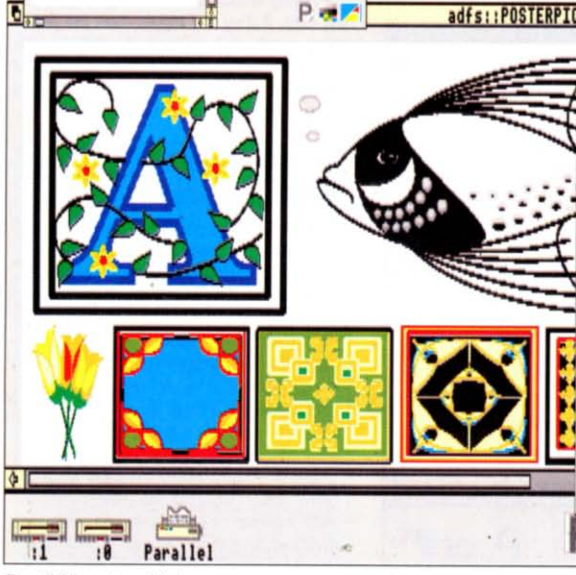
This clearly demonstrates the care taken to make Poster as self explanatory as possible, a fact also shown in the easy to follow menu structure. This is complemented and cross referenced to quick view menu

➤

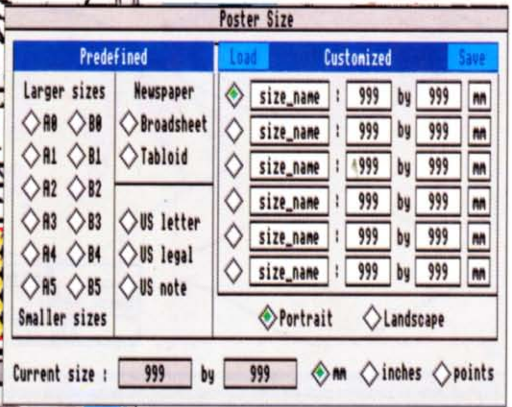
Product: Poster
Price: £65 (basic pack) £89 (complete pack)
Supplier: 4Mation Educational Resources, Linden Lea, Rock –ark, Barnstaple, Devon EX32 9AQ.
Tel: 0271 45566
Requirements: A3000 and Archimedes series


Poster
Borders
GATEWAY
HOUSE
Surround
(MENU: new style)
Margin : 15
◈mm ◇inches
◇points
Scale : 1.00

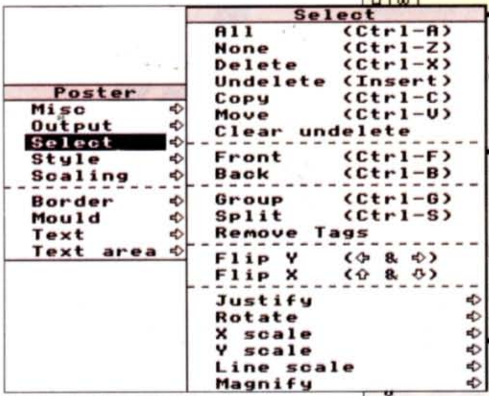
Design your own borders


adfs::POSTERPICS.$.LINE_ART
:1
:0
Parallel

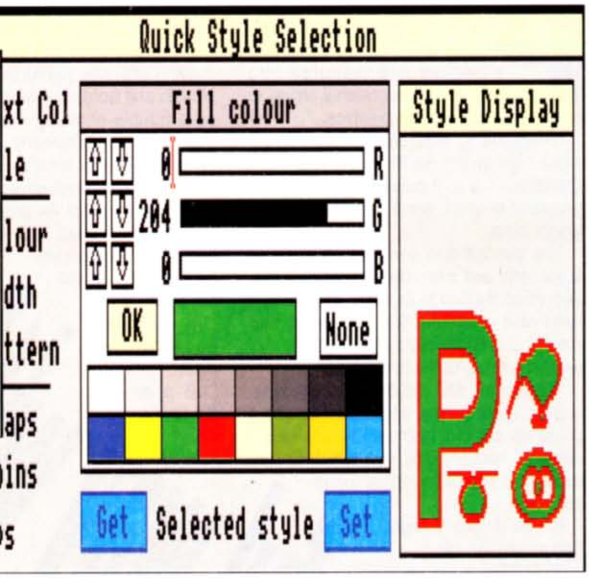
Beautiful line art provided


Poster Size
Predefined
Load
Customized
Save
Larger sizes
Newspaper
◇A0 ◇B0
◇Broadsheet
◇A1 ◇B1
◇Tabloid
◇A2 ◇B2
◇A3 ◇B3
◇US letter
◇A4 ◇B4
◇US legal
◇A5 ◇B5
◇US note
Smaller sizes
◈ size_name : 999 by 999 mm
◇ size_name : 999 by 999 mm
◇ size_name : 999 by 999 mm
◇ size_name : 999 by 999 mm
◇ size_name : 999 by 999 mm
◇ size_name : 999 by 999 mm
◈Portrait
◇Landscape
Current size : 999 by 999
◈mm ◇inches ◇points

Easy page setup


Poster
Misc
Output
Select
Style
Scaling
Border
Mould
Text
Text area
Select
All (Ctrl-A)
None (Ctrl-Z)
Delete (Ctrl-X)
Undelete (Insert)
Copy (Ctrl-C)
Move (Ctrl-V)
Clear undelete
Front (Ctrl-F)
Back (Ctrl-B)
Group (Ctrl-G)
Split (Ctrl-S)
Remove Tags
Flip Y (⇦ & ⇨)
Flip X (⇧ & ⇩)
Justify
Rotate
X scale
Y scale
Line scale
Magnify

Excellent keyboard shortcuts


Quick Style Selection
xt Col
le
lour
dth
ttern
aps
Line Joins
End Caps
Fill colour
0 R
204 G
0 B
OK
None
Get
Selected style
Set
Style Display

Self explanatory menus

➤

boxes, an excellent function key strip and a whole range of keyboard short cuts.

The complete package has 77 borders ranging from plain to highly decorative which can be loaded by dragging them from the disc directory into the Poster window.

They can then be moved, rescaled or reproportioned to fit any rectangular shape so that you can work inside them with text or objects. They can also be positioned round text or line art with full control over margin size to produce a simple but highly effective panel poster.

The borders are in !Draw format and can be split into their separate elements for experimentation or grouped together with any text or objects to be scaled to any new size or proportion.

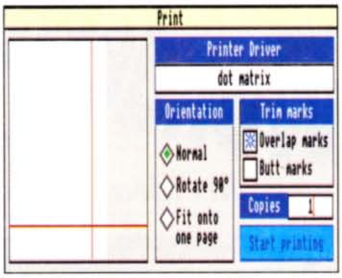
Moulds can be used to mould text into any shape provided on disc or produced by the user with !Draw. Objects can be distorted by placing them in a mould, producing effects which would be either very time consuming or otherwise impossible.

Geometric distortion of basic shapes is dealt with very clearly in the manual and should encourage users to draw and experiment.

Production of plastic text is very straightforward and can be handled in a number of ways. Any word processor which saves files in !Edit format can be used to produce the text.

Once in Poster you can change the number of columns, font size and colour. Normal text can be entered in single lines, with full control over colour, outline and fill colour as well as size by working from the menu or using the quick menu available from a comprehensive set of function keys.

The most exciting text facility is Path Text, which flows along any path which – like a mould – you load from disc or draw yourself. The font style menu gives control of justification, shadow effects and slope, as well as automatically adjusting them to fit a given path or mould.


Print
Printer Driver
dot matrix
Orientation
Trim marks
◈ Normal
☒ Overlap marks
◇ Rotate 90°
☐ Butt marks
◇ Fit onto one page
Copies 1
Start printing

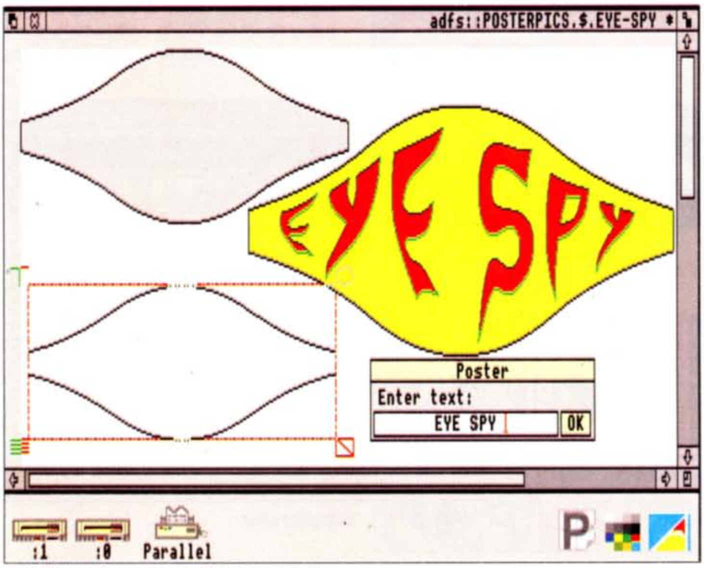
As you like it printing

Printing is standard, and posters can be any size. If they are bigger than the paper being used, it is printed in sections with trim marks showing where to cut it. You could also force your design on to a single sheet of paper using the Fit option.

Summing up

The Art Machine packages are very well produced and thought out. The accompanying booklet is full of ideas, activities and resources and I would highly recommend both, even though the superb graphics of Cyclic Stories and the fascinating fractal generation of Trees would make me opt for pack one if I had to choose between them.

Poster parallels developments in DTP as it allows total control over text and graphics. You're given the tools to produce really professional artwork for a wide variety of purposes and anyone involved in graphic design in any way should seriously consider buying it.


adfs::POSTERPICS.$.EYE-SPY *
EYE SPY
Poster
OK
:1
:0
Parallel

Enter text: EYE SPY

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VISA

THE multi-tasking alarm clock provided with the Archimedes computers and BBC A3000 is very useful but it does take up quite a bit of memory. So most people resort to *F12 TIME* to find the current time.

Then there's the problem of getting into Basic, or loading a program for editing, or *DUMPing and *TYPEing files – all of which are command line tasks requiring you to exit the DeskTop environment.

But now, thanks to the power and flexibility of the Risc OS, all these – plus a calculator – are available at the click of the mouse. And they are all crammed into 16k.

Loading !ClockCalc into the DeskTop is simple – just double-click on its icon. !ClockCalc appears on the icon bar as a simple digital clock, and shows the time as well as providing these additional functions:

- A calculator
- An easy way of entering Basic
- Facilities to list several filetypes

The calculator can be displayed by clicking Menu on the clock. You can select whether the results are in decimal, hex or binary. You can enter any expression Basic understands, for example:

```
SQR(17^2+13^2)*SINRAD(45)
```

Results are real numbers, but hexadecimal and binary notations use integer and therefore can only display numbers from -2^31 to +2^31.

You can set variables by entering the following as an expression:

```
:<a>=<expression>
```

where <a> is a one letter variable name.

You can also define two functions, one with a single variable called FNf(x), and one with two variables called FNg(x,y), by entering this as an expression:

```
:<f>=<expression>
```

where <f> is either f or g, to define FNf or FNg respectively. You should use x and y as the arguments for the expression.

Functions can be accessed by including something like this in an expression:

```
FNf(45)
```

or:

```
FNg(10,17*SQR(10))
```

If the expression you enter produces an error, or you define a variable or a function in an incorrect way, the error is shown in the result icon.

The calculator leaves the screen when you move the pointer out of its window. If you drag a Basic file on to the clock icon it is loaded, and entered if the Editor is available. By dragging a sprite file on to the clock icon, all sprites contained in it are listed in a window with the following information for each sprite: Name, x and y size (in pixels), the mode in which it was defined, whether or not it has a mask or palette data – M or P.

If you drag a text, command, or obeyfile on to the clockicon it is *TYPEd inside a window. And dragging another type of file issues a *DUMP command. If you click with Select on the icon Basic is entered and using Adjust enters the Basic Editor. You can quit ClockCalc by clicking the Quit icon inside the calculator window.

Creating !ClockCalc

Before typing the listing in create a new directory called !ClockCalc on your disc. Then load up !Edit and, using its icon bar menu, create an Obey file containing these lines:

```
|
| ClockCalc !Run file
|
SET ClockCalc$Dir
WimpSlot -min 16k -max 16k
RUN <ClockCalc$Dir>.!RunImage
```

This must be saved as !Run inside your new !ClockCalc application directory which can be opened up by double-clicking its icon while holding down the Shift key.

Now double-click the file to run it, you will get an error message but this ensures that when you type in the main program – !RunImage – it will be saved to the right place.

Now enter the Basic Editor and type in the listing. You can make sure it is correct using the Archimedes checksum generator. As long as the first line is entered correctly, and you have double-clicked the icon, the program will be saved to the !ClockCalc directory.

If you wish to make !ClockCalc appear with an icon in the Filer window, you'll need to create one:

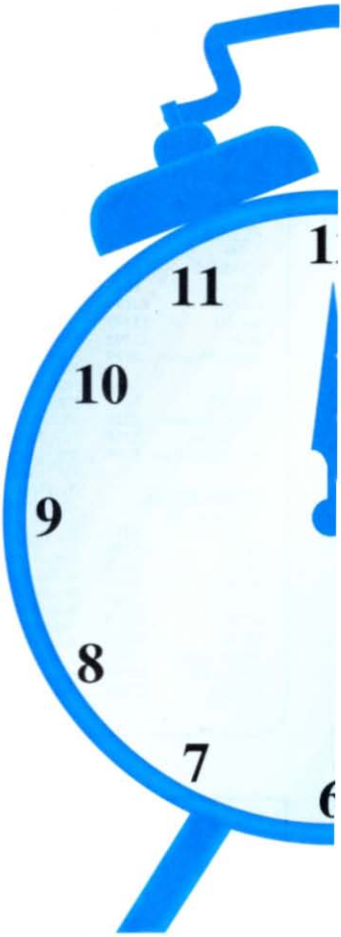
- Load !Paint.
- Create a Mode 12 sprite called !ClockCalc, with size 34 x 17, and a mask.
- Draw sprite.
- Save the file in the !ClockCalc application directory as !Sprites.

Because !ClockCalc is so small, you can nearly always have it loaded into the DeskTop.

How it works

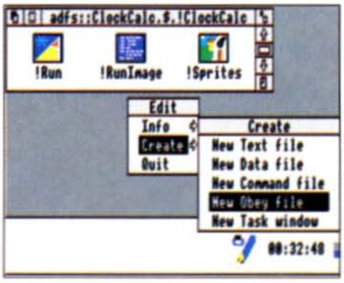
When the program is run it initialises itself as a Wimp program and enters the standard loop using *Wimp_PollIdle* which returns a result when something happens, or after one second if nothing happens.

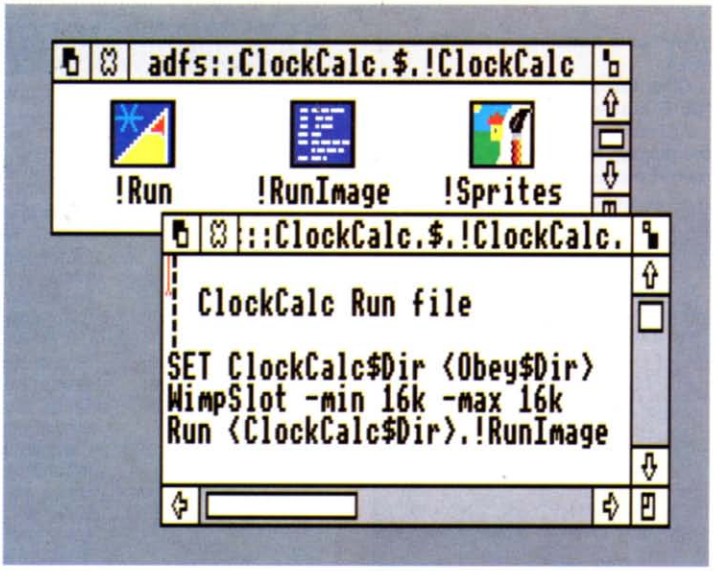
The clock is updated by changing *$clock%* which is the text associated with the icon bar icon. and telling the Wimp that it has changed by calling the routine *Wimp_SetIconState* this causes an automatic update of the icon on the bar.



Entering an expression to be evaluated is performed using a writable icon, so that the Wimp does most of the job. When Return is pressed the program is informed that input is completed via *Wimp_2PollIdle*.

A variable is set by storing the Ascii code




adfs::ClockCalc.$.!ClockCalc
!Run
!RunImage
!Sprites
::ClockCalc.$.!ClockCalc.

```
|
| ClockCalc Run file
|
SET ClockCalc$Dir <Obey$Dir>
WimpSlot -min 16k -max 16k
Run <ClockCalc$Dir>.!RunImage
```

short, effective and easy to run

Time-savers

Daniel Wagnaar provides several much-needed DeskTop accessories in one neat package

of its name at *set%* and calling PROCset. A function is defined by storing its definition at *fnf%* or *fng%*.

Completed expressions are calculated using EVAL. A binary representation of a number is calculated by scanning it bit by bit, and shifting a 1 or 0 into the result string.

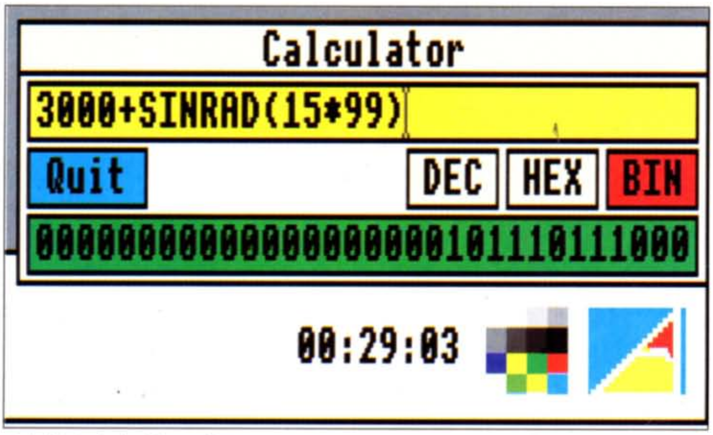
Loading a Basic program is arranged by typing EDIT into the keyboard buffer using a series of *FX138 commands then issuing a system command which starts a new task:

```
WimpTask BASIC -load
```

12
1
2
3
4
5
6
7
8
9
10
11

A sprite file is displayed by opening a text window using the command *Wimp_CommandWindow*, opening the sprite file for input – using OPENIN – then reading the information for

➤


Calculator
Quit
DEC
HEX
BIN

3000+SINRAD(15*99)

00000000000000000000101110111000

00:29:03

Calculate in decimal, hex or binary

➤
every sprite contained in the file using BGET.

Other files are displayed by *TYPE or *DUMP in a text window.

And there you have it, a short but effective program to provide those simple, but needed, accessories.

```
   10 REM > <ClockCalc$Dir>.!RunImage
   20 REM by Daniel Wagenaar
   30 REM (c) The Micro User
   40 :
   50 ONERROR IFFNerror("Unexpected erro
r: "+REPORT$+" (int. error "+STR$ERL+")
Must I quit?",3)=1:SYS "Wimp_CloseDown":
END
   60 CLEAR:PROCivars:PROCiwimp
   70 SYS "OS_ReadMonotonicTime" TO ot%
   80 REPEAT
   90 SYS "Wimp_PollIdle",,q%,ot% TO r%
  100 SYS "OS_ReadMonotonicTime" TO nt%
  110 WHILE nt%>ot%:ot%+=100:ENDWHILE
  120 CASE r% OF
  130 WHEN 0:PROCct
  140 WHEN 3,4:SYS "Wimp_CloseWindow",,q
%
  150 WHEN 6:PROCmbc
  160 WHEN 8:PROCkp($input%)
  170 WHEN 17,18:PROCmess
  180 ENDCASE:UNTIL quit%
  190 SYS "Wimp_CloseDown":END
  200 :
  210 DEFFNf(x)=:::::::::::::::::::::::::
::::
  220 DEFFNg(x,y)=:::::::::::::::::::::::
::::::
  230 DEFPROCset(a$):=EVAL(a$):ENDPROC
  240 :
  250 DEFPROCivars
  260 DIM q%400, clock%9, input%33, outp
ut%33
  270 quit%=0:e%=&4362345E:mf%=&7000021
  280 xs%=536:ys%=160:u%=2:v%=&C701603D
  290 T%=PAGE:PROCc:fnf%=T%+2:PROCc:fng%
=T%+2
  300 REPEAT T%+=1:UNTILLEFT$($T%,3)="):
="
  310 set%=T%+1:ENDPROC
  320 :
  330 DEFPROCc:REPEAT T%+=1:UNTIL LEFT$(
$T%,3)=")=:":ENDPROC
  340 :
  350 DEFPROCiwimp
  360 SYS "Wimp_Initialise",200,&4B53415
4,"Clock/Calculator"
  370 PROCiib:PROCtemp:ENDPROC
  380 :
  390 DEFPROCiib:RESTORE 420:PROCb
  400 SYS "Wimp_CreateIcon",,q% TO iconh
%
  410 PROCct:ENDPROC
  420 DATA -1,0,0,136,72,&17002139,clock
%,-1,9,e%
  430 :
  440 DEFPROCb::T%=q%-4:REPEAT T%+=4:REA
D !T%:UNTIL!T%=e%:ENDPROC
  450 :
  460 DEFPROCtemp:RESTORE 490:PROCb:$inp
ut%=""
  470 SYS "Wimp_CreateWindow",,q% TO cal
ch%
  480 ENDPROC
  490 DATA 742,820,1278,980,0,0,1808,683
54195,459271,786691,0,-1024,1280,0,61,12
288,0,0,&636C6143,&74616C75,&FF0D726F,6
  500 DATA 7,-52,531,-4,&E700F135,input%
,-1,33, 7,-154,531,-106,&A7006335,output
%,-1,33
  510 DATA 302,-102,374,-54,v%,&D434544,
0,0,380,-102,452,-54,v%,&D584548,0,0
```

➤

The nitty gritty

Most of the SWI's used in this program were described in the series about writing a Wimp program published in *The Micro User* from January to June 1989, but the table below describes them in brief.

OS–ReadMonotonicTime	Returns the current 100Hz timer value.
Wimp_PollIdle	Polls the Wimp to find out if anything has happened. This call, unlike Wimp–Poll, returns only when something happens or after a certain time has elapsed.
Wimp_CloseWindow	Closes a window but does not remove its definition from the Wimp.
Wimp_CloseDown	Informs the Wimp that the application has quit
Wimp_Initialise	Informs the Wimp that a new application has started.
Wimp_CreateIcon	Creates an icon having -1 in the window–handle field means: Put the icon on the iconbar.
Wimp_CreateWindow	Creates a window, but doesn't open it.
Wimp_SendMessage	Sends a message to another application. In this case, it is used to inform the filer that the loading of a file has finished.
Wimp_SetIconState	Changes the flags of an icon and redraws it.
Wimp_ReportError	Informs the user that an error has occurred.
Wimp_CommandWindow	Opens a text window with a title string pointed to by the first parameter. With no parameter it waits for the user to press a key or click a button and closes the window.
***WimpTask**	Starts a new task.

Main variables

calch%	Handle of the calculator window.
$clock%	Text displayed in the icon.
e%	Value that makes PROCb stop copying to *q%*.
f$	Name of the file dragged to the icon.
fnf%, fng%	Pointers to the address in memory where function definitions are stored
iconh%	Handle of the icon on the iconbar.
$input%	Expression in the input icon.
$output%	Result of expression evaluation.
q%	Pointer to workspace for parameter blocks.
quit%	When set to TRUE, the program quits.
set%	Pointer to the address where variable names are stored.
u%	Display format: 2=decimal, 3=hexadecimal, 4=binary
v%	Iconflags for the DEC, HEX and BIN icons.

Various other variables are used locally in procedures, but they are not important to the main program flow.

Procedures

error	Function that displays an error.
ivars	Initialises all main variables used in the program.
c	Finds the address of an FN.
iwimp	Initialises window and icon definitions.
b	Reads a parameter block from data to memory pointed to by *q%*.
iib	Initialises the icon bar.
temp	Creates calculator window.

The program is constructed around a WHILE ... ENDWHILE Wimp_Poll loop which calls the following procedures:

ct	Changes the clock display on the icon bar.
mbc	Determines a button click.
gob	Goes to Basic.
oc	Opens the calculator.
sel	Selects decimal, hexadecimal or binary display.
edit	Types EDIT into the keyboard buffer.
kp	Accepts a key press
assign	Assigns a value to a variable or defines a function.
f	Displays text Invalid assignment.
set	Sets a variable.
sr	Shows a result.
d	Defines a function.
e	Displays text Function has been defined.
rs	Calculates a result.
mess	Checks for load–file and quit messages.
lf	Loads a file.
cw	Creates a text window and shows file.
lb	Loads a Basic file.
slist	Lists a sprite file.
b	This function reads a word from a file

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- KX-P1081 Panasonic printer and professional printer stand, good condition. £95 for them both or separate offers. Phone: Stephen, evenings 0843 298902.
- Morley Teletext adapter. ATS/Support roms, manuals, utility disk. £40 ono 051 678 9879.
- Wanted: Acornsoft database, Starstore. Rom, Viewstore, Brighton 0273 557883 Evenings.
- BBC B issue 7, 40/80 drive, toolkit rom joystick, 60+ games including Repton, Mini Office II, Elite, Revs. Micro User from Feb 84 including discs, Beebug from July 82 write P.Fullia 110 Lydgate, Burnley BB10 2DU.
- Morley master(AA) Rom board excellent. Wanted modem, consider (part) exchange 0792 201898.
- BBC B, Viglen twin disk drive with PSU, Philips Amber monitor, Taxan printer software and manuals. Complete system £400. Tel: 081 995 8546 Evenings.
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- BBC B twin drives, sideways Ram, Rom, wordwise+ Midi. Colour monitor, many books. £300. FX80 NLQ printer £80. 081 952 8899.
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➤

```
  520 DATA 458,-102,530,-54,v%,&D4E4942,
0,0,7,-102,100,-54,&F701903D,&74697551,1
3,e%
  530 :
  540 DEFPROCmess
  550 CASE q%!16 OF
  560 WHEN 0 :quit%=TRUE
  570 WHEN 3 :PROClf
  580 ENDCASE:ENDPROC
  590 :
  600 DEFPROClf
  610 LOCAL T%,f$
  620 f$=STRING$(250," "):f$="":T%=q%+44
  630 WHILE ?T%<>0:f$+=CHR$?T%:T%+=1:END
WHILE
  640 CASE q%!40 OF
  650 WHEN &FFF,&FFE,&FEB:PROCcw("Type")
  660 WHEN &FFB:PROClb
  670 WHEN &FF9:PROCslist(f$)
  680 OTHERWISE:PROCcw("Dump")
  690 ENDCASE
  700 q%!12=q%!8:q%!16=4:SYS "Wimp_SendM
essage",17,q%
  710 ENDPROC
  720 :
  730 DEFPROClb:PROCedit:OSCLI "WimpTask
 Basic -Load "+f$:ENDPROC
  740 :
  750 DEFPROCedit
  760 *FX 138,0,69
  770 *FX 138,0,68
  780 *FX 138,0,73
  790 *FX 138,0,84
  795 *FX138,0,46
  800 *FX 138,0,13
  810 ENDPROC
  820 :
  830 DEFPROCgob:OSCLI "WimpTask Basic":
ENDPROC
  840 :
  850 DEFPROCmbc
  860 LOCAL x%,y%:x%=!q%:y%=q%!4
  870 CASE (q%!12) OF
  880 WHEN -2
  890 CASE (q%!8) OF
  900 WHEN 4:PROCgob
  910 WHEN 2:PROCoc
  920 WHEN 1:PROCedit:PROCgob
  930 ENDCASE
  940 WHEN calch%:CASE q%!16 OF
  950  WHEN 2,3,4:PROCsel(q%!16)
  960  WHEN 5:quit%=TRUE:SYS "Wimp_Close
Window",,q%+12
  970  ENDCASE
  980 ENDCASE:ENDPROC
  990 :
 1000 DEFPROCct
 1010 IF$clock%<>RIGHT$(TIME$,8):$clock%
=RIGHT$(TIME$,8):!q%=-2:q%!4=iconh%:q%!8
=0:q%!12=0:SYS "Wimp_SetIconState",,q%
 1020 ENDPROC
 1030 :
 1040 DEFFNerror(e$,b%):!q%=0:$(q%+4)=e$
+CHR$0
 1050 SYS "Wimp_ReportError",q%,b%,"Cloc
k/Calculator" TO ,b%
 1060 =b%
 1070 :
 1080 DEFPROCslist(f$)
 1090 LOCAL n%,o%,b%,t%,h%,u%,v%,x%,y%,m
%,z$,m$
 1100 h%=OPENINf$:SYS "Wimp_CommandWindo
w",q%+44
 1110 PRINT "Name"SPC(9)"hor x ver  Mode
  M  P"'
 1120 n%=FNb:o%=FNb:b%=-4
 1130 FORt%=1TOn%
 1140 PTR#h%=o%+b%:b%+=o%:o%=FNb
 1150 FOR u%=1TO12:VDU BGET#h%:NEXT
 1160 x%=FNb:y%=FNb:v%=-FNb+FNb-31:m%=FN
b:IFm%=PTR#h%-4:m$="N" ELSE m$="Y"
 1170 IFm%EORFNb:z$="Y" ELSE z$="N"
 1180 m%=FNb:SYS "OS_ReadModeVariable",m
%,9 TO ,,u%
 1190 x%=(32*(x%+1)+v%) DIV 2^u%
 1200 PRINTTAB(13,VPOS)SPC(4-LEN(STR$x%)
);x%"x";y%+1;
 1210 PRINTTAB(25,VPOS);m%TAB(30,VPOS)z$
"  "m$
 1220 NEXT:CLOSE#h%:SYS "Wimp_CommandWin
dow":ENDPROC
 1230 :
 1240 DEFFNb:=BGET#h%+BGET#h%*2^8+BGET#h
%*2^16+BGET#h%*2^24
 1250 :
 1260 DEFPROCoc:LOCAL x%:x%=!q%-268
 1270 RESTORE 1320:PROCb
 1280 SYS "Wimp_OpenWindow",,q%
 1290 SYS "Wimp_SetCaretPosition",calch%
,0,,,-1,LEN$input%
 1300 ?q%=3:q%!1=x%+&C0010C
 1310 SYS "OS_Word",21,q%:PROCsel(u%):EN
DPROC
 1320 DATA calch%,x%,112,x%+536,272,0,0,
-1,e%
 1330 :
 1340 DEFPROCsr(a$):$output%=a$:RESTORE
1360:PROCb
 1350 SYS "Wimp_SetIconState",,q%:ENDPRO
C
 1360 DATA calch%,1,0,0,e%
 1370 :
 1380 DEFPROCkp(a$)
 1390 IF !q%=calch% AND q%!4=0 AND q%!24
=13 THEN
 1400 IFLEFT$(a$,1)=":" PROCassign(a$) E
LSE PROCrs(a$)
 1410 ENDIF:ENDPROC
 1420 :
 1430 DEFPROCassign(a$):LOCAL b$:PROCf
 1440 IFMID$(a$,3,1)="=":?set%=ASC(MID$(
a$,2,1)):PROCset(MID$(a$,4)):PROCsr("Var
iable has been set")
 1450 IFMID$(a$,3,2)=":=" THEN
 1460 CASE MID$(a$,2,1) OF
 1470 WHEN "f":b$=$fnf%:PROCd:$fnf%=b$:P
ROCe
 1480 WHEN "g":b$=$fng%:PROCd:$fng%=b$:P
ROCe
 1490 ENDCASE
 1500 ENDIF:ENDPROC
 1510 :
 1520 DEFPROCd:LEFT$(b$)=MID$(a$,5)+":":
ENDPROC
 1530 DEFPROCe:PROCsr("Function has been
 defined"):ENDPROC
 1540 DEFPROCf:PROCsr("Invalid assignmen
t"):ENDPROC
 1550 :
 1560 DEFPROCrs(a$)
 1570 LOCAL t%,T%:LOCAL ERROR
 1580 ON ERROR LOCAL:PROCsr(LEFT$(REPORT
$,32)):ENDPROC
 1590 IFa$="":PROCsr("Enter expression."
):ENDPROC
 1600 CASE u% OF
 1610 WHEN 2:PROCsr(STR$(EVAL(a$)))
 1620 WHEN 3:PROCsr("&"+STR$~(EVAL(a$)))
 1630 WHEN 4:t%=EVAL(a$):a$=""
 1640 FORT%=31TO0STEP-1:IFt%AND(1<<T%):a
$+="1"ELSEa$+="0"
 1650 NEXT:PROCsr(a$)
 1660 OTHERWISE:PROCsr("Unknown base")
 1670 ENDCASE:ENDPROC
 1680 :
 1690 DEFPROCsel(s%):LOCAL T%,c%:!q%=cal
ch%
 1700 u%=s%:FOR T%=2TO4
 1710 IFT%=s%:c%=11ELSEc%=12
 1720 q%!4=T%:q%!8=c%<<28:q%!12=15<<28
 1730 SYS "Wimp_SetIconState",,q%
 1740 NEXT:PROCrs($input%):ENDPROC
 1750 :
 1760 DEFPROCcw(a$):SYS "Wimp_CommandWin
dow",q%+44
 1770 OSCLI a$+" "+$(q%+44):SYS "Wimp_Co
mmandWindow":ENDPROC
```

Get it right ✓

```
  10 =    0 0   310 = 7C29 F   610 = FF57 2   900 = 64ED A
  20 =    0 0   320 = 9719 8   620 = 9B84 7   910 = AE1D 4  1200 = 91F7 F  1490 = 6827 E
  30 =    0 0   330 = 991C 1   630 =  5BA B   920 = 24DA 9  1210 = AF38 4  1500 = 63F7 D
  40 = 9719 9   340 = 9719 E   640 = DE79 5   930 = 6827 6  1220 = EFC4 9  1510 = 9719 F
  50 = 16FB 1   350 = 157B 6   650 = 93AB 3   940 = FE47 9  1230 = 9719 9  1520 = D710 0
  60 = CB3F 7   360 = D2BF 4   660 = EA7F 5   950 = 6D0E 1  1240 = 9454 E  1530 = 488C A
  70 = D7A8 7   370 = B2A8 A   670 = C70B 6   960 = 8CE3 D  1250 = 9719 E  1540 = E58E 4
  80 = BFBA 8   380 = 9719 5   680 = C29B C   970 = 6827 D  1260 = F570 B  1550 = 9719 5
  90 = CC26 C   390 = 79EE C   690 = 6827 7   980 = D157 F  1270 = 1B67 A  1560 = 73CD F
 100 = E098 1   400 = F3FE 9   700 = AAFA D   990 = 9719 3  1280 = A936 A  1570 = DDE5 2
 110 = DE2D 9   410 = BA42 4   710 = ED0F 7  1000 = 7CDD 7  1290 = 9C7F 6  1580 = 87E4 0
 120 =  544 D   420 = 2058 5   720 = 9719 6  1010 = 7E9B 1  1300 = D188 B  1590 = 48D2 0
 130 = CD25 3   430 = 9719 5   730 = 7AB9 0  1020 = ED0F 7  1310 = B7A1 8  1600 = 5469 F
 140 =  311 C   440 = EB6F 0   740 = 9719 E  1030 = 9719 F  1320 = 649A 5  1610 = 3C96 D
 150 = 4E11 5   450 = 9719 3   750 = BCBF 9  1040 = 7E70 D  1330 = 9719 D  1620 = A485 9
 160 = 7F13 F   460 = 5D42 0   760 = 3BAE 0  1050 = 3399 B  1340 = 57E1 E  1630 = A72C 1
 170 = 512F 0   470 = 1B9C F   770 = 2B8F B  1060 = 9E7B 2  1350 = 2D1A 3  1640 =  954 F
 180 = 3FAD 8   480 = ED0F 0   780 = A9D5 0  1070 = 9719 9  1360 = 29FF F  1650 = 32B9 4
 190 = 5242 6   490 = 6808 3   790 = C90C A  1080 = 2F68 B  1370 = 9719 6  1660 = 736D E
 200 = 9719 5   500 = AE70 4   795 = EDE1 4  1090 = EEF0 5  1380 = CF79 0  1670 = D157 6
 210 = 582D 4   510 = 83CF 7   800 =  373 A  1100 = 607C 5  1390 = 7818 3  1680 = 9719 2
 220 = BA52 4   520 = 7ABC 9   810 = ED0F 4  1110 = BAA5 3  1400 = CDA1 4  1690 = C85E 9
 230 = 4C8D 4   530 = 9719 0   820 = 9719 C  1120 = 101B D  1410 = 63F7 4  1700 = 2026 7
 240 = 9719 7   540 = 9213 8   830 = 2DD8 1  1130 = F797 B  1420 = 9719 D  1710 = AC7C C
 250 = E940 3   550 = D09C 2   840 = 9719 4  1140 = 7A3A C  1430 = B282 C  1720 = 6F6A 4
 260 = 7F65 7   560 = 3335 0   850 = 8C0A A  1150 = 4DD6 6  1440 = 6661 5  1730 = 78D6 6
 270 = C361 3   570 = 5E21 4   860 = B940 8  1160 = 896B 9  1450 = 4253 E  1740 = CE0F E
 280 = EC81 5   580 = D157 E   870 = 9038 7  1170 = D70C 2  1460 = 4D2B E  1750 = 9719 0
 290 = 1103 7   590 = 9719 D   880 = A0BE F  1180 = B356 F  1470 = 3D9D 0  1760 = C8EE 0
 300 = 377E 7   600 = 5E90 F   890 = 570E 8  1190 = 54C4 F  1480 = C6CD 3  1770 = AA97 7
```

Going by the book

Get to grips with International Standard Book Numbers wth the help of Jon Millington

BOOKSELLERS can order a particular title by using a 10-digit number called the International Standard Book Number – ISBN. So as long as you know the number of the book you want, you can order it. The ISBN itself reveals the country of origin and publisher – these are allocated by a central organisation – while the publisher adds several digits to specify the book itself.

But the digit in the right-hand end – which is referred to as the *first* column – is used to check the other nine against copying errors and you work it out as follows:

Multiply the digit in second column by 2, that in the third column by 3, that in the fourth column by 4, and so on. Add all these products, divide this answer by 11 and then subtract the remainder from 11. This gives the required check digit. For remainders of 0 and 10, the check digits are 0 and X respectively.

So you check the number 1 85058 020 0 like this:

```
(0 x 2) + (2 x 3) + (0 x 4) + (8 x 5) +
(5 x 6) + (0 x 7) + (5 x 8) + (8 x 9) +
(1 x 10) = 198
198 / 11 = 18 remainder 0.
```

Subtract this remainder from 11 to give 0 modulo 11, thus making the check digit 0.

Of course there is no guarantee that a number with the right check digit is necessarily correct, but the most likely error is that one digit is wrong, and the program will reveal this.

If you enter an ISBN that is not 10 characters in length you are asked to re-enter it, and the same applies if any of the first nine characters are not digits.

```
  0 REM Int. Std. Book Number Check
 10 REM by Jon Millington
 20 REM (c) The Micro User
 30 MODE 7
 40 REPEAT
 50 REPEAT
 60 INPUT'"Enter ISBN (no spaces) "A$
 70 UNTIL LEN A$=10
 80 T=0
 90 FOR N=2 TO 10
100 H=ASC MID$(A$,11-N,1)-48
110 IF H<0 OR H>9 THEN T=600
120 T=T+N*H
130 NEXT N
140 IF T>500 THEN 50
150 T=(11-T MOD 11) MOD 11
160 R=ASC RIGHT$(A$,1)-48
170 IF T<10 AND R=T THEN N=0
180 IF T=10 AND R=40 THEN N=0
190 IF N=0 PRINT'"ISBN is OK":GOTO 50
200 PRINT'"Wrong ISBN. ";
210 PRINT "Check digit should be ";
220 IF T=10 PRINT "X" ELSE PRINT;T
230 UNTIL FALSE
```

Main variables

A$	Holds the 10 figure ISBN you have entered.
T	The running total obtained by multiplying the columns in turn by the appropriate column number.
N	The column number, with 10 being at the left-hand end.
H	The value of the digit in the current column.
R	The value of the digit in the right-hand end column.

```
  0 =    0 0  |   80 = C794 A  |  160 = 98B3 6
 10 =    0 0  |   90 = 3C0D E  |  170 = B9B1 7
 20 =    0 0  |  100 = F9CA 7  |  180 = E44E 0
 30 = 1092 2  |  110 = 59E6 5  |  190 = 186D 9
 40 = BFBA B  |  120 = D9B6 1  |  200 = 89DA 3
 50 = BFBA 6  |  130 = 4D8C 6  |  210 = BDF4 7
 60 = 5CFE D  |  140 = D362 3  |  220 =  C91 2
 70 = 2B7C F  |  150 = 9918 9  |  230 = 226C 4
```

Program breakdown

Lines 40 to 230	are the loop to keep the program running until you press Escape or Break.
Lines 50 to 70	ask you to enter your 10 figure ISBN.
Line 80	sets *T* to zero.
Lines 90 to 130	are the loop to work out a numerical value for your ISBN.
Line 140	makes the program branch to line 50 for you to re-enter your ISBN if any of the first nine characters you typed are not digits.
Line 150	calculates the correct value of the check digit.
Line 160	finds the Ascii value less 48 of your check digit.
Lines 170 and 180	see if the check digit you entered is correct.
Line 190	lets you know if your ISBN is correct and, if it is, makes the program branch to line 50 for you to enter another one.
Lines 200 to 220	tell you that your ISBN is wrong and what its correct check digit should be.

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New Ports for Old

It's no pantomime as Mike Cook shows how to add a user port to any micro. Oh no, he doesn't...Oh yes, he does...

WHEN assessing a new computer the quote: *"A computer is defined by its inputs and outputs"* Has always been my guiding maxim. To most people, inputs and outputs simply mean keyboard and screen, but there's a lot more to it than that.

The original Model B exemplified the idea of a good computer for its time as, not only were the graphics good, but it simply bristled with sockets for getting signals into and out of the machine.

This made it possible to add an almost bewildering range of devices for the BBC Micro to interact with. Long standing readers of this column will know of the many ideas we have explored. However in the marketplace the quest for sales often dictate a machine should be as cheap as possible, and the first things to suffer are the choices of input and output.

This was seen in the Electron and Compact, which were stripped of their most interesting ports. The Archimedes, too, has suffered in this respect. You can, of course, get Acorn's Input/Output Expansion Card, but this is expensive.

The input/output device I most use is the user port, which provides eight lines allowing you to monitor or control all sorts of devices. So what I thought I would do is design a device that could act as a low cost input/output port on any computer.

Making a port

Most micros have a serial port because it is cheap and simple to add, and some printers require this sort of interface. Therefore I decided to design an adaptor to give me a parallel user port from the serial port.

Serial data transmits bytes one bit at a time – we say the data is *time division multiplexed.* This just means that at any one time we are only sending one bit – we can send a word, or collection of bits, over one transmission channel.

The channel can be a pair of wires, a telephone line, tape recorder or radio link. But at any one time we are only sending one bit of the information.

It is the job of the transmitter to break up the data word and present it one bit at a time to the output. Conversely the receiver must assemble the bits to make up the complete word.

The way this is done on most computers is to send the data asynchronously – as a bundle of bits with a marker at the start and end of the parcel. These markers are designated, with a flash of inspiration, as the start bit and end bit. If we represent a line as having two states we can see the state of the line at any time during the transmission of a word in Figure I.

The line states are known as *mark* and *space* and can take on many physical forms. For example at the computer level this is represented by 5 volts and 0 volts, known as TTL signals. The RS232 standards represents these by less than -3 volts and greater than +3 volts, and on a telephone line they are represented by different audio tones.

The method by which these are broken up and re-assembled is a little too involved to get into here, but suffice it to say that it is sufficiently complex to merit the use of large scale integration to get the whole function on to a dedicated chip. In fact, it was one of the first functions made into an integrated circuit.

One of the first companies to do this gave the device the name UART standing for Universal Asynchronous Receive Transmitter, what's more they made the name a trade mark, thus preventing rivals from using it. However it was so successful that the trade mark stuck as a generic name in most people's minds.

So the heart of the input/output port is a UART. Nowadays most UARTs are bus-orientated, that is, they are designed to be connected to a computer bus, however the AY-3-1015D is designed so that the inputs and outputs are available separately.

The main idea is that we should arrange the signals around the UART so that when a word has been received it automatically sends another one back – or auto echoes, as we say. In this way if we want to read the value on the input lines we send out a word, rather like a request, and the answer is the reading we need.

We have three problems when designing this port: Conditioning the serial signals, generating the baud rate and the auto echo. The full circuit is shown in Figure II. The UART has a Data Available output (DA) which goes high whenever a new serial word has been received. We can then invert this and send it to the Data Send ($\overline{DS}$) input to transmit our inputs to the computer.

When this is done the DA output needs resetting by placing a logic zero on the ($\overline{\text{Reset DA}}$) line. In order that the DA line is not reset before it has time to trigger the $\overline{DS}$ we route the signal through two inverters.

The propagation delay, that is the delay between a change in input and a change appearing on the output, ensures we send the next byte before resting the DA line.

The DA signal and the $\overline{DS}$ signal are brought out to the screw connectors to allow for maximum flexibility. That is, it will allow some device to send data to the computer without it being prompted. However for most purposes these two signals should be connected together.

The baud rate is the speed at which the serial data changes. The baud is a unit of bits per second and there are a number of standard speeds. The UART requires a

➤

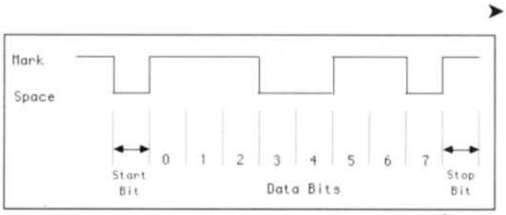

Figure I: Serial Data

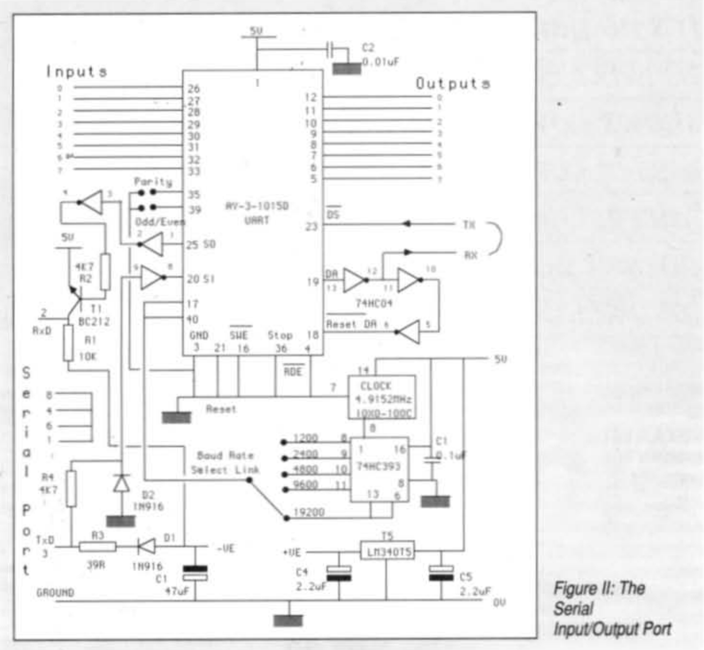

Figure II: The Serial Input/Output Port

➤

clock signal 16 times the baud rate required.

There is a low cost crystal oscillator package that runs at 4.9152 MHz, and if you divide this figure by 16 you will see that it comes out at 16 times the fastest standard speed of 19200 baud:

```
4915200 / 16 = 19200 * 16 = 307.2 KHz
```

Then from 307.2 KHz further divisions by two will give the other standard speeds. A 74HC393 is a dual 4 bit binary counter, so the first counter produces the initial division by 16 and the outputs of the second counter allow us to tap off the clock frequency we want for any speed between 1200 and 19200 baud.

Finally the RS423 serial output goes either side of zero volts, the mark state being negative. On the input side all we need to do is to clamp it to earth with a diode D2 and limit the input drive with the resistor R4. Then an inverting buffer will condition the signal so we can feed it into the UART.

The output drive is a little more complex. The positive-going single-ended output of the UART has to be converted into a negative-going bipolar output for the computer's serial input line. By the way, bipolar means going either side of zero volts, and single ended means only going one side of zero volts.

This is done with a PNP transistor T1, PNP transistors are sometimes called upside down transistors because they are switched into conduction by the base being more negative than the emitter – the opposite of NPN transistors' operation.

As T1 also performs the necessary inversion process, we don't need to invert the signal from the UART. However its current capability could do with boosting, so we pass it through two inverters. This brings the number of inverters to six – which is precisely the number you get in one package.

The only fly in the ointment is that we need a negative power source for the output signal. This is where we can be clever and pinch the power from the serial input (this is negative and occasional when the serial signal arrives it goes positive). Therefore we need a diode D1 to tap the negative part of the signal This is smoothed by C1 and fed to the output drive via R1.

Unfortunately the UART and other circuitry take about 40mA, which is too much to power the whole interface in this way, so in addition to the negative supply we need a 5 volt positive supply.

We can get this from a number of different sources. The simplest is a battery or other form of unregulated supply. To cope with this I have included an 5 volt IC voltage regulator in the circuit. The regulated output is also available from screw connectors, and can be used to power any additional circuitry.

However if we are cunning we can tap some of the power directly from the computer. To do this we take a wire from the 5 volt screw terminal and attach it to any of the red power wires feeding the main computer board.

These are spade connectors, so all we need to do is remove it and slip the wire through the small hole in the spade. Then push the red wire back on and it holds our wire in place. We only need one wire, as our earth return will be made through the serial lead's earth.

All the components to build the serial port input/output board are available as Body Build kit No. 69. The printed circuit board has labels identifying each input and output. Connection is made to the A3000 or Archimedes through a 9 pin D-Type plug lead.

If you are using the Model B or Master you will need the 5 pin DIN domino lead and if you have an BBC A3000 you will need the serial upgrade chips fitting as well.

The software needed to drive this port is a bit different from that used to drive the serial port, but is easily substituted. It is written assuming that you have set the board for 9600 baud and no parity. This means the parity link should be removed. I find it best just to place the link on one pin so that it is not lost.

Listing I shows the simple routines you will need to drive the port. Lines 40 to 90 set up the serial drivers in your computer. Lines 130 to 170 are an endless loop that asks you to enter a number this number is sent to the serial port and a number is collected, both are then displayed.

Lines 190 to 290 make up the function to drive the port. First we make sure that we are going to send an 8 bit number using the AND operator to trim off any excess digits, line 220. Then we switch input and output buffers to the serial port, lines 230 and 240.

Now line 250 sends the byte and line 260 receives the echo. The following lines switch the buffers to the keyboard and screen and return the received value.

Notice that the program could lock up the computer. If the serial port interface board is not connected or working properly the computer will hang at line 260. Pressing Escape will not help matters, as you will not be switched through to the keyboard and screen. Therefore line 20 sets up an error trap which restores the correct devices and prints an error message when Escape is pressed.

A good way to test the board is to connect all the inputs to all the outputs, thus ensuring that you get back exactly what you send out.

If you want to change software written for the Model B's User Port you have to substitute lines 50 to 90 for the initialisation line that accesses the VIA's data direction register at &FE62. Whenever the port is written to or read you should replace the line with a call to FN_SP(N%) where *N%* is the number you want to read.

For example, suppose you had:

```
60 ?&FE60=13
```

you should replace it with:

```
60 Dum%=FN_SP(13)
```

Dum% being a dummy variable to catch the value returned by the board. On the other hand if you had:

```
60 A%=?&FE60
```

It should be replaced with:

```
60 A%=FN_SP(S%)
```

with *S%* being the last bit pattern, if any, ➤

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written to the port. An idea of this in action can be gained from Listing II, which is a fully-fledged port monitor program incorporating the functions in Listing I.

Basically it displays, in binary form, the bit state of all the inputs and outputs on the serial port interface board. A loop, lines 140 to 200, continually send out the same byte and display both the transmitted byte and received byte.

Any change on the input lines of the port will be immediate reflected on the screen. By using the keys you can move to any output bit and change its value by hitting the spacebar.

So now equipped with a low cost means of tapping your computer's power you can use many of the Body Build articles no matter what type of micro you own.

Listing II

```
  10 REM >Sport_IO
  20 ON ERROR GOTO 300
  30 PRINT"Serial Port Input Output Test"
  40 REM This is the initilisation
  50 *FX7,7
  60 REM 9600 BAUD RECIEVE
  70 *FX8,7
  80 REM 9600 BAUD TRANSMIT
  90 *FX156,18
 100 REM 8 BITS NO PARITY 1 STOP
 110 REM Serial Interface now set up
 120
 130 REPEAT
 140 INPUT"Send ",B%
 150 A%=FN_SP(B%)
 160 PRINT A%;" Is recived when ";B%;"
is sent"
 170 UNTIL FALSE
 180
 190 REM Send and Read a byte
 200 DEF FN_SP(B%)
 210 LOCAL R%
 220 B%=B% AND &FF
 230 *FX2,1
 240 *FX3,3
 250 PRINT CHR$(B%);
 260 R%=GET
 270 *FX2,0
 280 *FX3,0
 290 =R%
 300 REM ERROR ROUTINE
 310 ON ERROR OFF
 320 *FX2,0
 330 *FX3,0
 340 PRINT"ERROR ";ERR;" AT LINE ";ERL
```

```
 10 =    0 0    130 = BFBA B    250 =  E5A 1
 20 = 5A7D D    140 = 201E B    260 = 63E3 3
 30 = FB5E 8    150 =  274 2    270 = 4102 4
 40 =    0 8    160 = AAAA A    280 = 7632 B
 50 = DA15 8    170 = 226C 6    290 = 9BEE 7
 60 =    0 8    180 = D1AD 1    300 =    0 7
 70 = F624 5    190 =    0 1    310 = F4C9 2
 80 =    0 5    200 = E2DB 9    320 = 4102 7
 90 = 7BF8 F    210 = 769D 8    330 = 7632 5
100 =    0 F    220 = 4095 0    340 = 460E A
110 =    0 F    230 = 5123 6
120 = D1AD B    240 = 4651 2
```

Listing II

```
  10 REM >Sport_M
  20 MODE 1
  30 PRINT"Beeb Body Building Course"
  40 PRINT"Serial Port Input Output Mon
itor"
  50 PRINT"By Mike Cook"
  60 ON ERROR GOTO 780
  70
  80 *FX7,7
  90 *FX8,7
 100 *FX156,18
 110 PROC_SETUP
 120 B%=0
 130 CB%=1
 140 REPEAT
 150 PROC_DIS(B%,14)
 160 C%=INKEY(0)
 170 IF C%<>-1 THEN PROC_COM(C%)
 180 A%=FN_SP(B%)
 190 PROC_DIS(A%,8)
 200 UNTIL FALSE
 210
 220 DEF PROC_SETUP
 230 PRINT TAB(0,6);" 7  6  5  4  3  2
 1  0"
 240 PRINT TAB(25,8);"Port Input"
 250 PRINT TAB(0,12);" 7  6  5  4  3  2
 1  0"
 260 PRINT TAB(25,14);"Port Output"
 270 PRINT TAB(22,15);"^"
 280 PRINT TAB(0,20);"Use < and > to mo
ve pointer"
 290 PRINT "Space Bar to change the bit
"
 300 PRINT
 310 PRINT"Q to Quit"
 320 ENDPROC
 330
 340 DEF PROC_DIS(B%,P%)
 350 LOCAL M%
 360 PRINT TAB(0,P%);
 370 M%=&80
 380 REPEAT
 390 IF M% AND B% THEN PRINT" 1 "; ELSE
 PRINT" 0 ";
 400 M%=M% DIV 2
 410 UNTIL M%=0
 420 ENDPROC
 430
 440 DEF PROC_COM(K%)
 450 IF K%=32 THEN B%=B% EOR CB%:ENDPRO
C
 460 IF K%=60 OR K%=44 THEN PROC_MB(1):
ENDPROC
 470 IF K%=62 OR K%=46 THEN PROC_MB(-1)
:ENDPROC
 480 IF K%=81 OR K%=113 THEN PRINT TAB(
0,24):END
 490 ENDPROC
 500
 510 DEF PROC_MB(N%)
 520 LOCAL BS%,CC%
 530 IF N%=1 THEN CB%=CB%*2 ELSE CB%=CB
% DIV 2
 540 IF CB%>255 THEN CB%=1
 550 IF CB%=0 THEN CB%=128
 560 PRINT TAB(0,15);SPC(23)
 570 BS%=25
 580 CC%=CB%
 590 REPEAT
 600 BS%=BS%-3
 610 CC%=CC% DIV 2
 620 UNTIL CC%=0
 630 PRINT TAB(BS%,15);"^"
 640 ENDPROC
 650
 660 REM Send and Read a byte
 670 DEF FN_SP(B%)
 680 LOCAL R%
 690 B%=B% AND &FF
 700 *FX2,1
 710 *FX3,3
 720 PRINT CHR$(B%);
 730 R%=GET
 740 *FX2,0
 750 *FX3,0
 760 =R%
 770
 780 ON ERROR OFF
 790 *FX3,0
 800 *FX2,0
 810 PRINT"Error ";ERR;" At line ";ERL
```

```
 10 =    0 0  |  230 = 47EF 6  |  450 = 16AB F  |  670 = E2DB 3
 20 = 7054 4  |  240 = C9B9 2  |  460 =  133 4  |  680 = 769D B
 30 = CCB2 1  |  250 = EA77 4  |  470 = 21A7 8  |  690 = 4095 A
 40 = 57E4 6  |  260 = 446C C  |  480 = 15FE 0  |  700 = 5123 C
 50 = FC23 9  |  270 = 813A E  |  490 = ED0F 6  |  710 = 4651 E
 60 = 7CD9 3  |  280 = AD4C 9  |  500 = D1AD 2  |  720 =  E5A 7
 70 = D1AD 0  |  290 = 1351 F  |  510 =  6EB D  |  730 = 63E3 E
 80 = DA15 B  |  300 = FF3E 5  |  520 = EB26 D  |  740 = 4102 B
 90 = F624 D  |  310 = 3E16 0  |  530 = 79B0 9  |  750 = 7632 1
100 = 7BF8 F  |  320 = ED0F C  |  540 = F0C5 C  |  760 = 9BEE 4
110 = FA64 E  |  330 = D1AD 4  |  550 = FEB1 F  |  770 = D1AD E
120 = AB58 2  |  340 = 54E8 7  |  560 = 2919 5  |  780 = F4C9 9
130 = 44C3 5  |  350 = 65D0 F  |  570 = 134E 6  |  790 = 7632 B
140 = BFBA C  |  360 = 53CD C  |  580 = C486 2  |  800 = 4102 E
150 = 3200 E  |  370 = 94D6 6  |  590 = BFBA 3  |  810 = 862B 0
160 =  CA5 3  |  380 = BFBA 0  |  600 = 4C81 1
170 = E811 3  |  390 = C5F6 0  |  610 = 9EDC 9
180 =  274 E  |  400 = A5D8 5  |  620 = D2CC D
190 = BEE4 6  |  410 = A8FD 6  |  630 = 11B0 2
200 = 226C E  |  420 = ED0F 2  |  640 = ED0F 9
210 = D1AD 6  |  430 = D1AD 4  |  650 = D1AD 4
220 = 6CAA E  |  440 = C381 5  |  660 =    0 4
```

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Helped by Jaochim Lous you too can beat the fractal monster

Defeating the dragon

FRACTALS continue to dominate the computer graphics world, but all you usually see are the pretty pictures that result from their use. There's seldom any attempt to explain how the display is created, and the reason is simple – most fractals are hard to understand. So let's take a look at one type that is fairly easy to comprehend.

Dragon curves are a whole family of fractals, named after their faint resemblance to oriental pictures of dragons. Featured here is the Harter-Heightway Dragon, the first one discovered.

There are lots of ways of generating dragon curves, the most effective involving complex mathematics. The method we'll be using, however, is quite straightforward, and requires no mathematical skills to understand. It is called the initiator/generator technique.

Imagine a straight, horizontal line. This will be our *initiator* or starting figure. Now replace this line with a right angle, the generator, as shown in Figure I. This is referred to as level one. At the next level we substitute each of the lines in the angle with a new right angle, one pointing to the right, and the next to the left (see Figure II).

Then treat this curve in the same way – level three – turning each line segment into a right angle, facing alternately right and left, as in Figure III.

Continue in this way infinitely and what do you get? If you have started every other level with an angle to the right and the rest with a left-hand one, you get a boring triangle. But if you start every level with an angle to the same side, you have the Harter-Heightway Dragon (Figure IV).

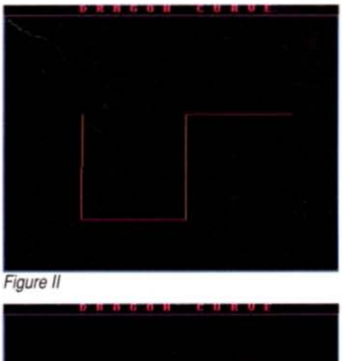

Figure II

Type in the listing, ensure you've made no typing errors using the checksums, then save it. When run it prompts you for the number of levels you want to go to: Level one will give you a right angle, higher levels produce more complex shapes.

Note that all the substitution is done before anything is drawn, so you will only see the level you have chosen on the screen.

Optimal resolution is around level 16 and the figure appears completely filled with colour. Anything higher just makes the edges blurred, and is a waste of time – the level 16 dragon takes more than an hour to

➤

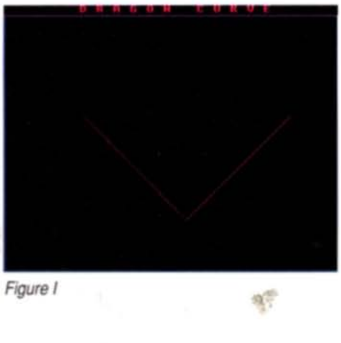

Figure I

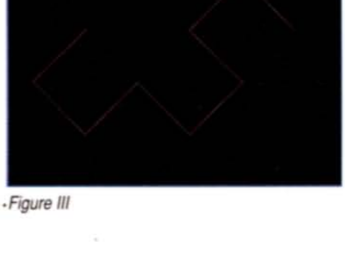

Figure III

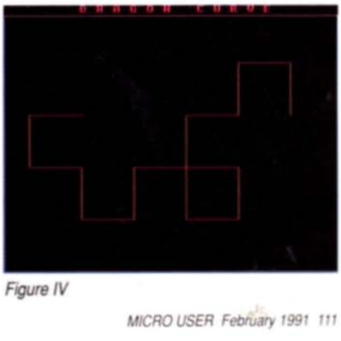

Figure IV

➤

draw on a BBC B. However, a level 10 one will give you a good idea of the shape, taking less than two minutes to complete.

Watching a, say level 8, dragon being drawn can be interesting enogh: Notice especially how the line winds away its immensely complicated course, never overlapping itself, only touching at the corners. Still, the best way to see the magic of it all is probably to start at level one and then go up in appropriate stps, watching the figure evolve.

Having waited an hour for your picture to finish, you might like to be able to look at it later without having to wait another hour, so a save option is provided.

The file created is actually the entire screen memory crammed into a disk or tape, and it can be displayed again by typing *LOAD .

This will have the whole screen up in a couple of seconds from disk, and at least less than an hour with a tape. Note that this type of file only loads properly in the mode it was saved from, so be sure to be in Mode 1 when loading it, or you'll get some very strange results.

If you are using an A3000 or Archimedes change line 180 to:

```
180 IF a$="Y" OR  a$="y" INPUT''"Filen
ame:"file$:PRINT'':OSCLI("SCREENSAVE "
+file$)
```

The heart of the program is the procedure PROCangle which, instead of drawing the first line in the the right angle, calls itself, turns 90 degrees, and when the second line should be drawn, calls itself again.

During both these executions of the procedure it calls itself twice, and so on. Each time, *levl%* is reduced by 1, unless it has reached zero, which is when lines are actually drawn.

An interesting effect is created when we retrace the curve, that is, rather than starting with a horizontal, we let the initiator be a straight line.

If we let the way back be in a different colour we will get a second, identical dragon that fits exactly into the first. Try adding

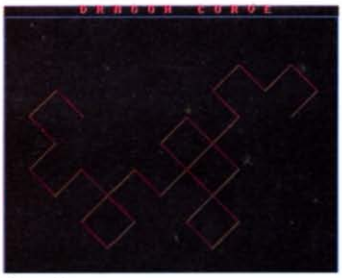

Figure V

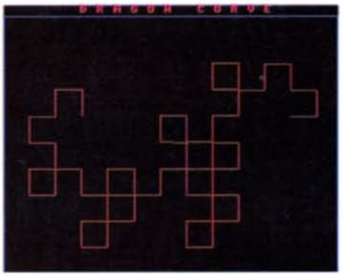

Figure VI

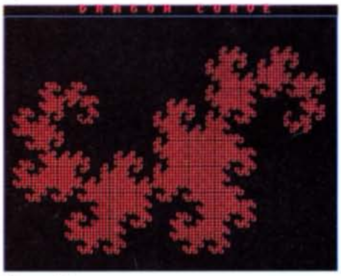

Figure VII

these lines to the program:

```
161 GCOL 0,3
162 PROCturn(180)
163 FOR A%=0 TO LEVL%
164 side(A%)=1
165 NEXT
166 PROCangle(lth,levl%)
```

And to make it all fit into the screen, change:

```
360 x=300:y=450:angl%=0:dir%=0
370 lth=650:const=SQR(.5)
```

and you will get a beautiful twin dragon. In fact, any number of dragons will fit perfectly into each other as long as all the initiators are lines in the same square-grid.

Many other weird shapes can be made with almost the same program. Try bending the rules for changing sides (side%) a little, both during the same level (line 480) and between levels (lines 130-150).

```
   10 REM DRAGON CURVE
   20 REM by Joachim Lous
   30 REM (c) The Micro User
   40 :
   50 REM Trap filing system errors:
   60 ON ERROR IF ERR>100 GOTO 550 ELSE
VDU26:REPORT:PRINT" at line ";ERL:END
   70 MODE1
   80 PROCinit
   90 REPEAT
  100 INPUT'"How many levels:"levl%
  110 UNTIL levl%>0 AND levl% <20
  120 PRINT:DIM side%(levl%)
  130 FOR A%=0 TO levl%
  140 side%(A%)=1
  150 NEXT
  160 PROCangle(lth,levl%)
  170 PRINT'"Save this screen? (Y/N):";:
a$=GET$
  180 IF a$="Y" OR  a$="y" INPUT''"Filen
ame:"file$:PRINT'':PROCoscli("SAVE "+fil
e$+" 3000 8000")
  190 PRINT''"Quit? (Y/N):";:a$=GET$
  200 IF a$="n" OR a$="N" RUN
  210 MODE 7:END
  220 :
  230 DEFPROCturn(A%)
  240 angl%=(angl%+A%)MOD360
  250 IF angl%<0 angl%=angl%+360
  260 dir=RAD(angl%)
  270 ENDPROC
  280 :
  290 DEFPROCfowd(A)
  300 x=x+A*COS(dir):y=y+A*SIN(dir)
  310 DRAW x,y
  320 ENDPROC
  330 :
  340 DEFPROCinit
  350 COLOUR 1:PRINT SPC(9) "D R A G O N
   C U R V E "
  360 x=300:y=600:angl%=0:dir=0
  370 lth=800:const=SQR(.5)
  380 VDU 19,1,1,0,0,0,19,2,4,0,0,0
  390 VDU 23,1,0;0;0;0;28,3,3,35,2
  400 GCOL0,2:MOVE0,0:DRAW0,980
  410 DRAW1279,980:DRAW1279,0:DRAW0,0
  420 GCOL 0,1:MOVE x,y
  430 ENDPROC
  440 :
  450 DEFPROCangle(lth,levl%)
  460 levl%=levl%-1:lth=lth*const
  470 side%(levl%)=-side%(levl%)
  480 PROCturn(side%(levl%)*45)
  490 IF levl%>0 PROCangle(lth,levl%) EL
SE PROCfowd(lth)
  500 PROCturn(-side%(levl%)*90)
  510 IF levl%>0 PROCangle(lth,levl%) EL
SE PROCfowd(lth)
  520 PROCturn(side%(levl%)*45)
  530 ENDPROC
  540 :
  550 REM File error handling:
  560 REPORT:PRINT'"Try again? (Y/N):";
  570 a$=GET$:IF a$="Y" OR a$="y" GOTO 1
80 ELSE GOTO 190
  580 GCOL 0,1
  590 :
  600 DEFPROCoscli($&700):LOCAL X%,Y%:X%
=0:Y%=7:CALL &FFF7:ENDPROC
```

```
 10 =    0 0 | 110 = E79C 1 | 210 = B7F8 2 | 310 = B8C9 1 | 410 = 88E0 9 | 510 = 4FAC 7
 20 =    0 0 | 120 = 9CFC E | 220 = 9719 A | 320 = ED0F 9 | 420 = 23B6 E | 520 =   48 0
 30 =    0 0 | 130 = CF61 C | 230 = D6CA 3 | 330 = 9719 3 | 430 = ED0F 7 | 530 = ED0F D
 40 = 9719 9 | 140 = 5E78 F | 240 = 5B4C 8 | 340 = 344C 9 | 440 = 9719 4 | 540 = 9719 C
 50 =    0 9 | 150 = 2C83 A | 250 = B457 9 | 350 = EB41 E | 450 = 2786 2 | 550 =    0 C
 60 = BD48 7 | 160 = 3800 9 | 260 = 2EA7 1 | 360 = 97A8 2 | 460 = EA04 D | 560 = 9D62 6
 70 = EA3A 0 | 170 = 9DF9 D | 270 = ED0F F | 370 = E56B 7 | 470 = C5B9 9 | 570 = 7A78 9
 80 = DEBB C | 180 = 42E5 8 | 280 = 9719 7 | 380 = 854D E | 480 = 6C62 7 | 580 = 619B A
 90 = BFBA E | 190 = 3934 C | 290 = EA09 4 | 390 = 2DC8 E | 490 =  E8A C | 590 = 9719 2
100 = CBC8 0 | 200 = FF8D D | 300 = F91D 8 | 400 = 7D57 D | 500 = AECF D | 600 = 6CCA B
```

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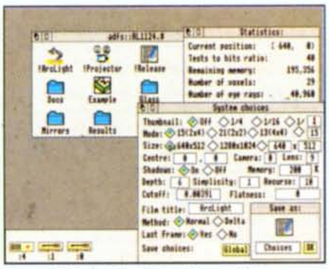
From Ted Kirk (MU), 33 Humber Crescent, ST. HELENS, Merseyside WA9 4HD 0744 818761 ***(leaflet available)***



Statistics:

Current position: (640, 0)
Tests to hits ratio: 40
Remaining memory: 195,356
Number of voxels: 29
Number of eye rays: 40,960

System choices

Thumbnail: ◆ Off ◇ 1/4 ◇ 1/16 ◇ 1/ [1]
Mode: ◆ 15(2x4) ◇ 21(2x2) ◇ 13(4x4) ◇ [15]
Size: ◆ 640x512 ◇ 1280x1024 ◇ [640] x [512]
Centre: [0] , [0] Camera: [0] Lens: [5]
Shadows: ◆ On ◇ Off Memory: [200] K
Depth: [6] Simplicity: [1] Recurse: [10]
Cutoff: [0.00391] Flatness: [0]
File title: [ArcLight]
Method: ◆ Normal ◇ Delta
Last Frame: ◆ Yes ◇ No
Save choices: Global

Save as: Choices OK

Figure I: Typical ArcLight dialogue box

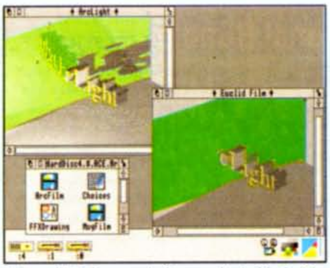


Figure III: Before and after results in Mode 21

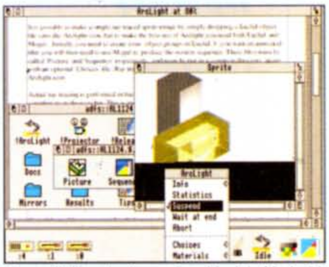


Figure II: Ray-tracing a glass block in Mode 21

Ray tracing for humans

Terry Blunt takes a different view of some old objects

Product: ArcLight
Price: £50
Supplier: Ace Computing, 27 Victoria Road, Cambridge CB4 3BW
Tel: 0223 322559

WITH Ace Computing's commitment to solid modelling on the Archimedes, it was quite predictable that they would make inroads into ray tracing. ArcLight is the new application in the Euclid suite that achieves this.

The idea behind ray tracing is that rays of light reaching the viewer's eye are back-tracked through a scene to their source, taking into account the objects encountered on the way and their surface materials.

Once all these eye rays have been fully investigated you should have a faithful interpretation of the scene with all reflections, refractions and shadows accurately reproduced.

In practice the scene has to be broken down into successively smaller 3D blocks – voxels – until it's simple enough for the rays to be traced in a reasonable time.

Although a straightforward concept, you can see that ray tracing is a complicated subject. This is reflected by the fact that ArcLight is one of the more difficult of Ace's packages to master. Even so, impressive films can be made quite easily using the default settings.

As with other Ace applications, ArcLight is fully multi-tasking, fitting seamlessly into the DeskTop environment. The package consists of an A5 instruction booklet along with a single disc with the software and examples. The application is put on the icon bar in the conventional manner with a double click on its icon – an angle-poise lamp.

You can make a single ray-traced sprite image by simply dropping a Euclid object file on to the ArcLight icon. But to make the best use of ArcLight you need both Euclid and Mogul.

Initially you create your object groups in Euclid. The materials you chose for the original objects now have real significance. Material 6 is interpreted as glass in ArcLight. The manual tells you about materials and how to alter their properties, but doesn't really explain their full significance.

If you want an animated film you will have to use Mogul to produce the motion sequence. These files must be called Picture and Sequence and have to be put in a common directory, along with an optional Choices file. Ray tracing is initiated by dragging this directory on to the ArcLight icon.

Actual ray tracing is performed in the background, with the percentage completion showing on the icon bar. This is particularly useful as complicated, high resolution films can take several hours to trace. Indeed, this review was written in a DTP system while the Archimedes was compiling a film.

You can use a fast mode that takes over completely, suspending multi-tasking – and even screen updates – until the film is complete or a mouse button is pressed.

When a film is completed a window opens giving the statistics of the ray tracing session. As well as information about the film, you are given details of the system's performance, including the total time taken to produce the film.

With practice you should be able to work more efficiently. Incredibly, it's also possible to show a film in !Projector while it's being compiled, so you can soon see if something is going drastically wrong.

Ace have enabled you to suspend ray tracing part way though and then carry on from that point. Although currently only documented in the !Release file, this extends to the ability to continue ray tracing an aborted session. All you need to do is insert the line *Frame n* in a choices file, where *n* is the frame you want to continue tracing from.

One of the problems associated with the sort of continuous development that has taken place with the Euclid suite, is that original specification of the older modules becomes stretched to the limit. Euclid is reaching this point, although ArcLight integrates with it correctly, Ace point out that there will be a significant improvement when upgrades are available.

Ace have started using a faster and more efficient data compressor known as Lempel-Ziv. This is in the Euclid module inside the application and will improve the performance of the other applications when ArcLight is loaded. Alternatively you could copy the Euclid module to the older versions to get the same improvement.

ArcLight itself is expected to be improved as its own code tweaked for greater efficiency. Ace maintain their offer of free upgrades, or where necessary, charge only the difference in price of new versions.

Ace have tended to concentrate more on speed and ease of use than absolute resolution accuracy, although this is being improved all the time. Consequently other ray tracers may give a more polished final result, but at a cost, and without the ease – or speed – of use.

Summing up

ArcLight adds yet another dimension to a very capable 3D modelling package, although I think the manual could be improved. The difference between a Mogul film and an ArcLight film of the same scene makes an interesting comparison. While good in its own right, a Mogul film is distinctly flat and lifeless against the ArcLight version.

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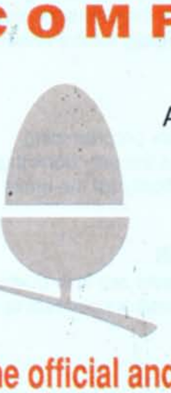

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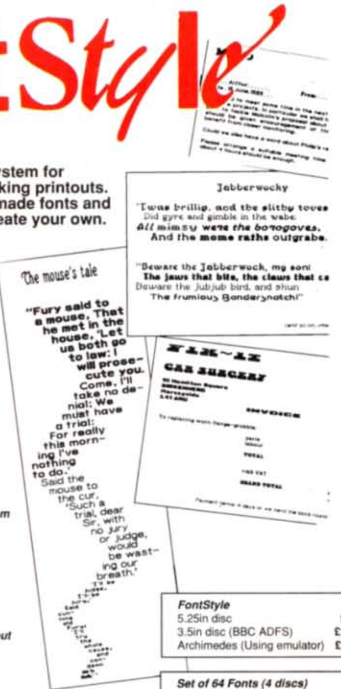

Jabberwocky

'Twas brillig, and the slithy toves
Did gyre and gimble in the wabe:
All mimsy were the borogoves,
And the mome raths outgrabe.

"Beware the Jabberwock, my son!
The jaws that bite, the claws that ca
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The frumious Bandersnatch!"

The mouse's tale

"Fury said to a mouse, That he met in the house, 'Let us both go to law: I will prosecute you. Come, I'll take no denial: We must have a trial: For really this morning I've nothing to do.' Said the mouse to the cur, 'Such a trial, dear Sir, with no jury or judge, would be wasting our breath.'

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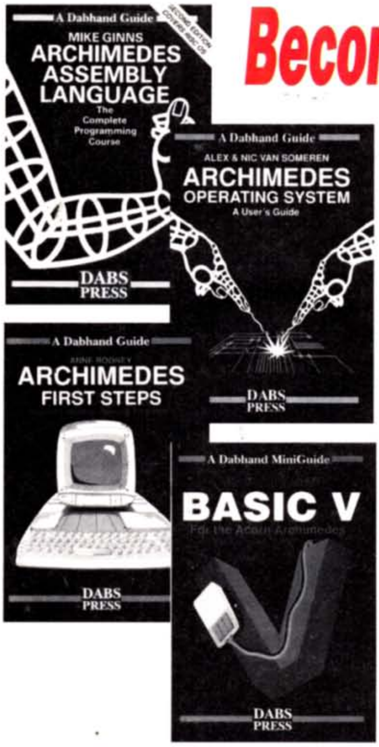
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- Produce a real-time on screen clock
- Fade text on all Acorn micros
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- Count words in multiple WW+ files
- Wipe secret files safely

Another selection of your handy routines brought together by Stephen Wade

Killing files

Author : Alison Fergusonl
Language : 6502 code
Filename : MrdrSrc

A ROUTINE was published in the December issue of *The Micro User* which allowed Archimedes and BBC A3000 owners to wipe files from their discs utterly by overwriting them with a standard character before erasing them from the catalogue, thus ensuring that absolutely no traces of them were left behind.

This short program assembles a piece of 6502 code – saved by the name of *Murder* – which performs the same task on a BBC Micro or Electron with DFS or ADFS.

When called – with **Murder* – the routine inputs the name of the file to be "murdered", and then using *osfile*, *osword*, *osfind* and *osbput* opens the file and overwrites it fully with Ascii 229 (&E5) before erasing it.

Remember: Use the utility with caution, as any files deleted by its use will be irretrievable afterwards.

```
   10 REM *Murder source
   20 REM by Alison Ferguson
   30 REM (c) The Micro User
   40 REM ------------------
   50 MODE 7:oswrch=&FFEE:osfile=&FFDD:o
sword=&FFF1:osfind=&FFCE:osbput=&FFD4:FO
R A%=0 TO 3 STEP 3:P%=&900
   60 [OPT A%:LDA #61:JSR oswrch:JSR osw
rch:LDA #62:JSR oswrch:LDA #0:LDX #blk M
OD 256:LDY #blk DIV 256:JSR osword
   70 LDA #5:LDX #blk2 MOD 256:LDY #blk2
 DIV 256:JSR osfile:LDA #128:LDX #file M
OD 256:LDY #file DIV 256:JSR osfind:TAY
   80 .loop:LDA #229:JSR osbput:SEC:LDA
blk2+10:SBC #1:STA blk2+10:LDA blk2+11:S
BC #0:STA blk2+11:ORA blk2+10:BNE loop
   90 LDA #0:JSR osfind:LDA #6:LDX #blk2
 MOD 256:LDY #blk2 DIV 256:JSR osfile
  100 RTS:.blk:OPT FNequw(file):OPT FNeq
ub(16):OPT FNequb(33):OPT FNequb(126)
  110 .blk2:OPT FNequw(file):OPT FNequs(
STRING$(16,CHR$0)):.file:OPT FNequs(STRI
NG$(16,"*")):]:NEXT
  120 PRINT ''" *SAVE Murder 900 ";STR$~
P%;"   to save code.":END
  130 DEF FNequb(S%):?P%=S%:P%=P%+1:=A%
  140 DEF FNequw(S%):!P%=S%:P%=P%+2:=A%
  150 DEF FNequs(S$):$P%=S$:P%=P%+LEN(S$
):=A%
```

If you have written a routine that may be of interest to other readers, and suitable for publication in this column, do not hesitate in sending it on disc or tape along with documentation to:

Stephen Wade, Routine Matters, The Micro User, Europa House, Adlington Park, Macclesfield SK10 4NP

Don't forget to tell us your name, address and telephone number, and enclose a stamped addressed envelope to guarantee the return of your media. Also provide us with a declaration stating that the routine is all your own work, has not been submitted elsewhere, and that we have your permission to use it.

Monthly cassette and disc

All of this month's routines can be found on the monthly subscription disc and cassette. On the 5.25" disc the programs reside in the "R" directory.

Those routines designed to work on the Archimedes series and A3000 micros are already file-typed on the 3.5" disc for your benefit – they are the ones without a blank icon when viewed at in the desktop environment.

Text fader for all

Author : Pete Goodliffe
Language : Basic
Filename : TxtFade

A COMPREHENSIVE fading routine for the Archimedes and BBC A3000 micros was published between the September and November *Routine Matters* columns last year. This was a complex piece of Arm code, but it is in fact quite easy to produce a standard text-only fading routine in Basic which works on all Acorn micros.

Although the 8-bit BBC Micro and Electron do not have the same capability as their 32-bit counterparts to redefine the RGB levels for each colour, the seven non-flashing palette colours do have different brightnesses.

By taking them in their order of brightness, and adding a short time delay in between overprinting, the desired effect can be achieved in a mode with a minimum of eight colours. Increasing the colour brightness allows a fade-on, and decreasing it a fade-off.

PROCtexton performs a fade-on for a given string, automatically centering the text at the same time, and *PROCtextoff* has the opposite effect.

```
   10 REM Text fade
   20 REM by Pete Goodliffe
   30 REM (c) The Micro User
   40 REM ------------------
   50 MODE 2:VDU 23,1,0;0;0;0;:DIM G%(7)
:FOR N=1 TO 7:READ G%(N):NEXT
   60 DATA 4,1,5,2,6,3,7
   70 PROCtexton("Text Fade",3)
   80 PROCtexton("Text fades on",10)
   90 PROCtexton("and off!!",12)
  100 TIME=0:REPEAT UNTIL TIME>200
  110 PROCtextoff("Text Fade",3)
  120 PROCtextoff("Text fades on",10)
  130 PROCtextoff("and off!!",12)
  140 PROCtexton("THE END",10):END
  150 DEF PROCtexton(A$,M)
  160 FOR N=1 TO 7:COLOUR G%(N)
  170 PRINT TAB((20-LEN(A$))/2,M)A$
  180 TIME=0:REPEAT UNTIL TIME>4
  190 NEXT:ENDPROC
  200 DEF PROCtextoff(A$,M)
  210 FOR N=7 TO 0 STEP-1:COLOUR G%(N)
  220 PRINT TAB((20-LEN(A$))/2,M)A$
  230 TIME=0:REPEAT UNTIL TIME>4
  240 NEXT:ENDPROC
```

WHEN writing a long document using Wordwise Plus it is often necessary to split the text into a number of smaller files to avoid the 23000 character limit. However this makes obtaining a total word count a lengthy process, calling as it does for the individual manual loading of each file in turn.

This short program, written in the native Wordwise Plus programming language, performs this task automatically.

The utility asks whether you would like embedded commands to be removed – press Y or N appropriately – and then takes filenames from a list in segment nine, which must be in the format of one file per line, loading each in turn into the main text area and making a count of both the individual and total number of words.

As the utility makes use of the main text area, don't use it while an important document is loaded.

CMOS route to protection

Author : Bill Hetherington
Language : Basic/6502 code
Filename : PassWrd

SURPRISINGLY little use has been made of the Master's battery-backed memory capability which allows it to retain some information while disconnected from the mains.

The utility given here makes use of bytes 40 through 46 of the CMOS ram to store a seven letter password. Lines 50 to 90 allow you to install a password and lines 100 onward generate a piece of code named *PW*.

This code is used to prompt the user to enter the password invisibly – there is no need to press Return – and checks it against that stored in memory.

Incorrect entry causes a beep. Correct entry gives you the option to change the password and subsequently return from the code.

With this utility, you could store a personal code in memory to identify the micro as your own, or use it as part of a more complex protection system.

Most importantly, the routine provides the key of how to access this area of memory.

```
   10 REM Password Routine
   20 REM by G.W.Hetherington
   30 REM (c) The Micro User
   40 REM ------------------
   50 CLS:REM Password installer
   60 PRINT "Please enter your 7 charact
er password."'"You will be asked to conf
irm it before"'"it is stored. (Anything
longer than 7"'"characters will be trunc
ated.)"''": ";:INPUT""PW$
   70 PRINT TAB(2,5)STRING$(37," "):PRIN
T TAB(2,5)LEFT$(PW$,7)
   80 PRINT '"Is this correct (Y/N) ?";:
REPEAT:G=(GET AND &DF):UNTIL G=78 OR G=8
9:IF G=78 PRINT TAB(0,7)STRING$(39," "):
PRINT TAB(2,5)STRING$(10," "):PRINT TAB(
2,5);:GOTO 40
   90 char=0:byte=39:FOR loop=1 TO 7:cha
r=char+1:byte=byte+1:OSCLI"FX 162 "+STR$
byte+" "+STR$(ASC(MID$(PW$,char,1))):NEX
T:PRINT ''"Password installed."''
  100 REM Create *PW object code
  110 pword=&70:oswrch=&FFEE:osrdch=&FFE
0:osnewl=&FFE7:osbyte=&FFF4
  120 FOR pass=0 TO 2 STEP2:P%=&900
  130 [OPT pass:LDA #&F:LDX #0:LDY #0:JS
R osbyte:LDA #&C:JSR oswrch:LDX #&FF
  140 .prompt INX:LDA question,X:JSR osw
rch:CPX #9:BNE prompt:LDX #&FF:JMP getpw
:.question EQUS "Password ?"
  150 .getpw INX:JSR osrdch:STA pword,X:
CPX #6:BNE getpw:LDA #&A1:LDX #&27
  160 .compare INX:PHA:PHX:JSR osbyte:PL
X:TYA:CMP &48,X:BNE dud:PLA:CPX #&2E:BNE
 compare:LDX #&FF:JSR osnewl:JSR osnewl
  170 .ok INX:LDA correct,X:JSR oswrch:C
PX #7:BNE ok
  180 .correct EQUS "Correct!":LDX #&FF:
JSR osnewl:JSR osnewl:JMP change
  190 .dud PLA:LDA #7:JSR oswrch:LDX #&F
F:JMP getpw
  200 .change INX:LDA ask,X:JSR oswrch:C
PX #&16:BNE change:JSR osrdch:AND #&DF:C
MP #&59:BEQ alter
  210 JSR osnewl:JSR osnewl:RTS
  220 .ask EQUS "Change Password (Y/N) ?
":.alter LDX #&FF:JSR osnewl:JSR osnewl
  230 .enter INX:LDA prompt2,X:JSR oswrc
h:CPX #&C:BNE enter:LDX #&FF
  240 .word INX:JSR osrdch:STA pword,X:C
PX #&6:BNE word:JSR osnewl:JSR osnewl:LD
A #&A2:LDX #&27
  250 .store INX:PHX:LDY &48,X:JSR osbyt
e:PLX:CPX #&2E:BNE store:RTS
  260 .prompt2 EQUS "Enter word : ":]:NE
XT pass:OSCLI "SAVE PW 900 "+STR$~P%
  270 PRINT '"PW Code saved.":END
```

Counting words of the wise

Author : Mark Robinson
Language : Wordwise Plus
Filename : WCount

```
REM Multiple files word count
REM by Mark Robinson
REM (c) The Micro User
REM ----------------
CLS
Z%=0
PRINT "Remove embedded commands?
";
P$=GCK$
IF P$="Y" OR P$="y" THEN P$="Y"
IF P$="Y" THEN PRINT "Yes"
IF P$<>"Y" THEN PRINT "No"
PRINT
SELECT SEGMENT 9
CURSOR TOP
IF EOT THEN GOTOerror
REPEAT
A$=GLT$
PRINT A$;
SELECT TEXT
LOAD TEXT A$
IF P$="Y" THEN PROCstrip
PRINT ".....";
PRINT WORDS
Z%=Z%+WORDS
SELECT SEGMENT 9
UNTIL EOT
SELECT TEXT
DELETE TEXT
PRINT
PRINT "TOTAL WORDCOUNT ";
PRINT Z%
.end
PRINT
PRINT "Press any key"
P$=GCK$
A$=""
P$=""
END
.error
CLS
PRINT "Files list not present."
GOTOend
.strip
CURSOR TOP
REPEAT
CURSOR AT 0
FIND "|G"
FKEY 3
FIND "|W"
IF EOT=FALSE THEN CURSOR RIGHT
FKEY 3
DELETE MARKED
UNTIL EOT
RECOUNT
ENDPROC
```

Clockwise

Author : Graham Kendall
Language : Basic
Filename : Clock

A MAJOR boon of the Master series and Archimedes/BBC A3000 micros over their predecessors is the built-in clock. With it, the current date and time are stored in battery-backed memory to provide an accurate display whenever **Time* is used.

The short program presented here shows how easy it is to display an accurate clock on any of the Acorn range by using the TIME function.

Two short procedures – *PROCSet Clock* and *PROCDisplayTime* – are used, the first of which inputs the current time, the latter displaying it correct to the nearest second.

As a demonstration, *PROCDisplay Time* is simply repeated, but both of the routines can be incorporated into any of your programs to be used whenever necessary.

The program is only really a skeleton for slightly more ambitious tasks. It could easily be developed to include the date, or be changed into a stopwatch, egg timer, countdown timer ... in fact anything connected with displaying time.

Because the program relies solely on the TIME variable, remember not to use lines such as:

```
570 TIME=0:REPEAT UNTIL TIME>50
```

in your programs, but to use:

```
570 T%=TIME+50
575 REPEAT UNTIL TIME>T
```

```
   10 REM Clock
   20 REM by Graham Kendall
   30 REM (c) The Micro User
   40 REM ------------------
   50 MODE 7:PROCSetClock
   60 REPEAT:PROCDisplayTime
   70 UNTIL FALSE:END
   80 DEF PROCSetClock
   90 Title$="Set Clock"
  100 PRINT SPC(10);CHR$(141);Title$
  110 PRINT SPC(10);CHR$(141);Title$
  120 REPEAT:INPUT TAB(3,10);"Please Inp
ut the Hour (0-23)";Hour
  130 UNTIL Hour>-1 AND Hour<24
  140 REPEAT:INPUT TAB(3,12);"And the mi
nutes (0-59)";Minute
  150 UNTIL Minute>-1 AND Minute<60
  160 TIME=100*60*(Minute+60*Hour):CLS
  170 ENDPROC
  180 DEF PROCDisplayTime
  190 Hour=TIME DIV 360000 MOD 24
  200 Hour$=RIGHT$("0"+STR$(Hour),2)
  210 Minute=TIME DIV (100*60) MOD 60
  220 Minute$=RIGHT$("0"+STR$(Minute),2)
  230 Second=TIME DIV 100 MOD 60
  240 Second$=RIGHT$("0"+STR$(Second),2)
  250 PRINT TAB(3,1);Hour$;":";Minute$;"
:";Second$:ENDPROC
```

The Micro User gui

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PROBLEM Solved

Your technical questions answered by MIKE COOK

Mouse mishaps

AFTER installing a 2Mb upgrade and replacement Memc chip to my A310 my mouse refused to work properly – the selection via the buttons became erratic and finally failed completely.

In addition I found that I couldn't escape from the DeskTop by pressing F12. Could the new boards be at fault or is it something else? My Archimedes is all but useless at the moment. – **M. R. Glass, Benson.**

● *To test your mouse run this program:*

```
10 MOUSE X,Y,B
20 PRINT B
30 GOTO 10
```

This should give you the values of 4,2 and 1 when each button is pressed in turn.

It is possible that wires have broken in your mouse cable, although the trouble with the DeskTop does point to something have gone wrong with your upgrade – contact the suppliers.

Terminal condition

MY ISSUE 7 BBC B has been giving me problems of late. When I switch it on the first tone sounds but not the second. The Mode 7 screen appears with the first two lines filled with garbage. This happens in the same way each time I turn it on.

A friend suggested that the problem may lie with the OS rom or with the keyboard connector, but the latter seems fine. If it is the OS rom how do I go about repairing it? – **D. Skeeles, Hitchin.**

● *This fault could be just about anything. Having said that, the keyboard connector is vulnerable, as are most plug and socket arrangements. You could try removing the keyboard and re-fitting it. If that has no effect this really is a problem for a service centre.*

Topics on the agenda...

- ***Mouse malfunction***
- ***Using old monitors***
- ***Unconnected address lines***
- ***TV adaptors***
- ***NTSC output connections***
- ***Crashing tapes***
- ***Mono from stereo***
- ***Monitor or TV?***
- ***Find the chip***
- ***The last tone***

The wrong address

I OWN a BBC Model B with disc drive, AMX Art and mouse and recently the system has developed a fault. When I type *HELP the BBC responds with:

```
DFS 2.10
DFS
PLOTOCAL£ASIC
```

while if I enter * HELP DFS, the reply is:

```
DFS 2.10
Acccess  (L(
PLOTOCAL£ASIC
```

I can catalogue the disc or load a file, but any other disc command returns with PLOTOCAL£ASIC. If I try *ROMS the BBC responds with a screenful of characters. – **S. J. Sutton, Ealing.**

● *As the faults cover more that one rom chip it is unlikely that the trouble lies in the chips themselves. Also as some disc commands work it is likely that all the data bus lines are correctly connected. This leaves only one possible culprit – the address lines.*

Possibly one or more address lines are not connected to the rom. This can be caused by the track cracking close to the soldered connection following flexing of the board when swapping chips.

The difficulty is in finding which track is involved, as the crack will be almost tcertainly too small to see.

One way would be to check the signals on the rom with an oscilloscope and see which one is not moving. Another would be to measure the output on the address pin with a meter and short to earth the same pin on the microprocessor chip. If it failed to ground them you've found it.

To repair a break simply connect a wire from the furthest rom chip to the corresponding line on the operating system chip.

Tape trouble

MY BBC is suffering from two seemingly totally unconnected problems which manifest themselves at regular intervals. The first is that the computer sometimes crashes as the tape recorder loads either the main software or data.

It seems to me that this is something to do with the tape recorder interface – a short circuit or a faulty component. However, apart from the circuit diagram in the User Guide, I don't know what the cause could be or what to try replacing.

The other problem concerns the UHF output. The colour on the screen often vanishes, although it is fine when used to watch TV programs. The problem occurs if I use a different TV.

I can recover the colour be repeatedly inserting the flylead from the TV into the computer or retuning the TV. I've tried replacing the TV lead but with no success. **– James Bellarby, Stonehaven.**

● *What is probably happening is that the cassette recorder's motor is interfering with the computer making it crash. This can be due to several things, but two are very common.*

First of all you could have "earth bounce", where turning on the motor

➤

Audio connections

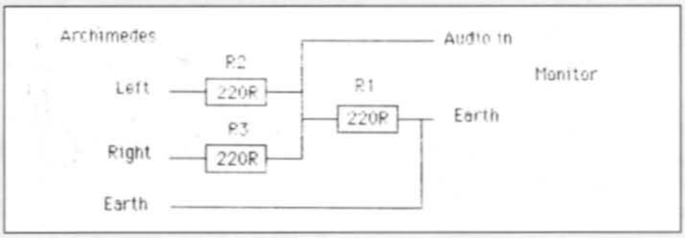
I HAVE an A310 and Acorn (badged) monitor which I have conncected using the supplied lead – a 9-pin D to Scart. I've also run an audio lead from the headphone output socket into the Scart plug and connected it to the two audio pins.

My problem is that beacuse the monitor only has one speaker and I'm driving it with two channels (left and right) together, the sound from the monitor and speaker becomes distorted at medium to high output levels.

Disconnecting the jack plug from the headphone socket restores the computer internal speaker so that it works normally without distortion.

I assume that I need to attentuate the audio left and right signals in order to mix them into the monitor, but I don't know what values of resistance to use. – **Alan Mothersole, Bracknell.**

● *Yes, you do need some from of attenuator and here is a suitable circuit. Adjust resistor R1 to give you the volume required.*



➤

causes the earth to change potential. This can be cured by running your recorder from batteries.

Secondly it could be the motor itself – you could try soldering a 0.1uF ceramic decoupling capacitor across it.

The TV problem is normally caused by the receiver going out of tune and losing the lock on the colour sub-carrier. Due to the low cost way the colour is encoded on your computer this is more critical than on a broadcast TV.

This is normally a problem with the stability of the TV set rather that the computer. However, you can try to adjust the trimmer capacitor on the sub-carrier oscillator – labelled VC1 and located in the top right hand corner of the board.

TV to RGB

I WAS wondering if you could possibly publish as a Body Building article how to make a TV adaptor for my monitor. I have heard about these but have never actually come across one. – **James Hamilton, Hounslow.**

● *This request raises two problems. Firstly standard RGB monitors used for all Acorn computers except the Archimedes have TTL inputs ,and so are unsuitable. The second, most convincing, is that making such a complex circuit yourself would cost far more than buying a mass produced unit.*

You can buy such devices commercially for about £60, and they are usually on display at computer and radio shows.

NTSC output

IN the August issue of *The Micro User* you recommended Mr Trenchord to change a crystal and disconnect an IC pin to convert his Master 128 to the NTSC television standard.

Surely it is simpler to alter the other side of the LK15 link – located near the middle of the left side of the main PCB – as shown in the Master Series Reference Manual? – **Matthew Kneebone, Mold.**

● *Removing link LK15 simply stops the alternate line signal reaching the colour modulator. This does indeed produce an NTSC output, but the colour sub-carier frequency is still that needed for our 625 line system. It is doubtful whether the Canadian TV set would lock on to it.*

The Master service manual also suggests changing the UM123/E36 modulator for a VHF version as the circuit board can accommodate both.

Recycling monitors

I AM considering buying an Archimedes, but to save money I would like to use my current monitor. It is a green screen Sanyo DM2112 and is currently being operated from the video out socket on my BBC B. As the monitor only has a video-in socket, I would like to know if it will work from the mono video socket on an Archimedes.

If this is successful would the software designed to work with a colour monitor operate with a monochrome display? – **Steven Flintham, Skegness.**

● *Yes, your monitor will work with the Archimedes. However, you would be missing a lot by losing the colour. Also it is possible that you won't be able to distinguish the monotone rendition of some colours – especially coloured text on coloured backgrounds.*

This way for chips

I WANT to buy a Shadow ram/printer buffer which is supposed to plug into the 6502 processor socket, but I don't know where this is. I would also like to sort out why my BBC B sometimes flickers and crashes. Can you help? – **Glyn Tucker, Crownhill.**

● *Turn off the power, open the lid and follow this guided tour: Start at the top right hand corner of the board, go down about five inches and then across by six inches and you you can't miss it – it's the one with 6502 written on it.*

As to your other problem, I'm afraid that your description of the symptoms is too vague, although it could be the video ULA chip acting up. This chip is located six inches down and three and a half inches across. Make sure that it is properly pressed into its socket.

Which monitor?

AS I plan to buy an A3000 I was wondering which was the best type of monitor to go with it.

I would quite like one which could receive TV pictures, such as the Microvitec1451AP. However, a friend said that TV/monitors have poor monitor quality.

Is it possible to buy a reasonably priced TV/monitor which doesn't sacrifice quality? – **Jeremy Benson, Bedford.**

● *The reason that most combined TV/monitors don't make good monitors is that they are designed as TV sets first. Then, more or less as an afterthough, a socket is placed on the back and they can be used as a monitor.*

Normally they have been built to a price, and that usually means using a tube with a lower resolution than that used in computer applications.

However, with the Microvitec this situation is reversed. The company designed the monitors first, later adding the TV capability. So the results are every bit as good as using a dedicated computer monitor.

Re-inking ribbons again

£10 *Prize letter*

WHEN doing major editing work and running off drafts for proof-reading you use up printer ribbons rather too quickly for the pocket, but I have no solved the problem quite efficiently and at a fraction of the cost of even one new ribbon.

My Panasonic KXP1081 ribbon cartridges have a rejuvenation hole: You insert a pencil point and a spring clicks over, pressing the ribbon on to a pre-inked roller pad.

When this roller eventually went dry it occurred to me that I might be able to re-ink it myself.

As the casing is merely pressed together, it was easy to take off the top and re-soak the sponge roller with stamp pad ink. And it worked quite well.

I have since discovered, however, that it is better to remove the roller and wash it thoroughly – I use washing up liquid – as it seems that either the inks are not quite compatible or else the roller just goes hard if not cleaned.

Take care initially when washing the roller, because if it is a bit hard it can disintegrate. However, once the bulk of the old ink is out you can be quite brutal.

So provided your printer cartridge does have a re-inking pressure roller you can simply add a few drops of stamp pad ink and save yourself umpteen pounds – one bottle of ink costs about 30p and will do many re-chargings.

Of course the ribbon will fall apart eventually but the savings are still enormous. – **Peter Noble, Old Glossop, Derbyshire.**

More Patience needed

I WAS fascinated to read A. S. Cockeril's solution to game 2285 of King Albert Patience – because the layout I get is totally different to his. Why is this? – **S. A. Sherwood, Huntingdon.**

● The game number is used to seed the random number generator, so for every machine that uses the same generator – the same set of machine code instructions – you'll get the same code.

All the 8 bit machines use the same code, so they'll give the same results. However, the Archimedes and BBC A3000 use a different code, so produce a different value.

Maddening MicroGolf

I AM having extreme difficulties with the MicroGolf program from the PD software on the Archimedes/A3000 subscription disc. When I ran the first version it kept asking me for modules I didn't have.

This was replaced the following month with a version that didn't do that, but this time the screen goes blank. And clicking a mouse key returns me to the DeskTop. What's going on? – **David Heath, Plymouth.**

● The problem is that you don't have any sprite area initialised. This isn't your fault and there's no reason why you should – except that the program assumes that there is some, and crashes when there isn't.

Unfortunately it's just poor programming. All programs that require sprite space should set up their own – it's just as simple as using the system's sprite space.

Less dangerous dog

HERE is an infinite energy modification for the November 1990 type-in game Danger Dog. *Copy the files Danger1 and Danger on to a blank disc, load the Danger2 file and type:*

```
120
130 UNTIL FALSE
RENUMBER
```

Now save the file as Danger2 and CHAIN"Danger1". The game will run and you won't die, but you can still get trapped – so all the fun is not gone. – Nicholas Mackenzie, Bromley, Kent.

Win a tenner

WANT to write to The Micro User? The addess is: Letters, The Micro User, Europa House, Adlington Park, Adlington, Macclesfield, SK10 4NP.

Writers of the most interesting letters receive a £10 prize.

Disc formatting

I HAVE been examining the format of the DFS disc catalogue and ran across a bit of a problem. Sector zero on track zero clearly holds the name and catalogue of each of the 31 files in blocks of eight bytes, seven bytes for the name and one for the catalogue.

Sector one of track zero contains the various load and execution addresses also in blocks of eight bytes, but I cannot work out what the sixth

➤

➤ *byte – counting from zero – is. It seems to be either CC or 00, but it's very unclear why. What are these bytes?* – **Paul Evans, Guisborough, Cleveland.**

● It's not really surprising you found this byte complicated, as it is actually composed of four different amounts, each two bits long. The important thing to remember is that on the DFS values are stored to an accuracy of 18 bits, not 16 as you might expect.

So the length and load/execution addresses each require two bytes and two bits for storage. In addition the seventh byte is used to specify the sector where the file starts on the disc. This uses 10 bits.

A typical file will have load and execution addresses of FFxxxx and FFyyyy. The FF is added in each case and is converted to just 3 or 11 in binary when put on the disc.

The file length is normally less than 64k, hence the top two bits for the file length will be zero: 00. The sector position is also normally less than the 256th sector, so the top bits for the sector number are 00 as well.

Combined in the order Load address, Length, Execution address, Position these can be combined to form a single byte which in binary will be:

```
1100 1100
```

which in hex appears as CC.

Snakes alive

HERE'S a couple more ideas for the snake program from the June 1990 issue:

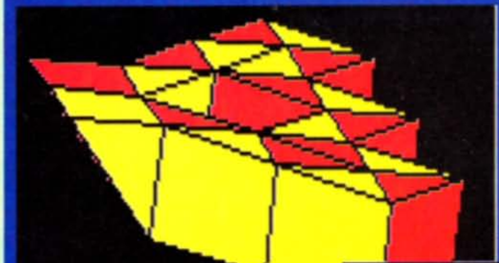
Speedboat

```
LDDDUUDUDUDUDUUDDDR
```

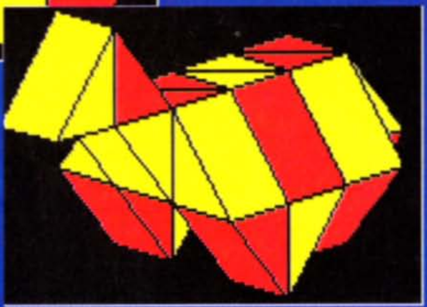
Turtle

```
UDLLLURLDLRULLDLULRURLU
```

– Mark Ainsworth, Amersham, Bucks.



Speedboat



Turtle

End of the line

AS many people know, there are two ways of storing character strings in files – either using the PRINT#X and INPUT#X commands which produces data unique to BBC Basic, or a loop inputting or outputting each character in turn. Strings are then terminated with character &0D.

*Until now I've always used the former method because it's less cumbersome to program, but the files are incompatible with commands like *TYPE and wordprocessors like View.*

I'm considering undertaking a massive changeover to the forward-facing text format, but I'd like to know whether you feel this is a sensible move.

As an isolated user I don't know what the industry standard has become, nor do I understand why character strings are more efficiently stored inside out. – **Colin Johnson, Hythe, Kent.**

● The trend is definitely for forward-facing code, with &0D used as the line delimiter. In fact, Basic V on the Archimedes provides BPUT#X,-<string>, with the option to omit the delimiter using ; at the end of the line.

There's also the complementary command – GET$#X, which will accept all the characters in a file up to the next &0D.

As for making the changeover, that's really up to you. If your material is going to be used on other computers making the alterations is probably worthwhile.

But if you're the only user of your own data, there's no real need to make the change if you're happy the way things are.

Sorry...

IN the January Software Scene we incorrectly said Interdictor II was being distributed by Cygnus Software Engineering rather than Clares Micro Supplies (0606 48511). Also the correct price is £34.95.

Joining the Jet Set

I HAVE a Model B with disc drive and should have got a BBC A3000 (Jet Set Pack) for Christmas. First of all I'd like to congratulate you for the Novermber issue which was great, I especially liked the Interdictor article, which was a special treat – any chance of more about how Acorn games are created?

I must say that I think BBC Nevryon is the most underrated game ever. It's the only R-Type style game for the Beeb, and although the scrolling is jerky the graphics are well-designed and the fast action makes up for it.

Your review made it 8 out of 10, but I think it should have been 10 out of 10. Is there going to be a sequel, or has 4th Dimension abandoned the 8 bit market completely?

The only new release for the BBC Micro in months has been Klax, and I fear that Superior are about to abandon the sinking ship in favour of the new one. It's a shame, because not everyone can afford an A3000 – it makes those 16 bit micros very tempting, even if they're not as good.

I'd also like to know why DTP software is so expensive? I'm very interested in this field but don't have £100 to spare.

I'm thinking of buying your Database DTP for my BBC Micro at £15 but I guess it doesn't have much room for pages.

Not only is DTP software expensive, what about wordprocessors? Are there any cheap ones? I use View to write a lot of plays and although it's quite friendly there's only 25k for the files. So what's can I use? – **Neil Brown, Hednesford, Staffs.**

● It is very unlikely that 4th Dimension will produce any more games for the 8 bit BBC Micro, but as you probably know, Superior Software have just released Sim City, which is a major item.

However the profit margins on 32 bit games are definitely better than those for 8 bit ones.

Archimedes DTP software may seem expensive compared to software for the BBC Micro, but on the Mac DTP packages start at over £500, and on the PC you can get reasonable packages for £100, but professional quality starts at £500 again.

Neither of these machines provide the facilities of !Poster or !FontFX for under £100, and fonts for these machines are much more expensive than those provided by the Electronic Font Foundry.

If you were to buy Impression II or Impression Junior you wouldn't need a separate wordprocessor, as they function very well at this simple job as well as providing extensive page layout facilities.

Take your partners...

HAS anyone seen a program that shows formation dancing? What I need is for Scottish dancing and will show men and women as different coloured – tartan – blobs, synchronised with the appropriate music.

It would be even better if I could input my own dances. Any ideas? – **Denise Holme, Tunbridge Wells.**

● I'm afraid we don't know of anything like this although it doesn't seem too complicated an idea – perhaps some reader would like to have a go.

View to a date

THANK you for printing my letter about producing dates in View in the November issue. Unfortunately all the quote marks – used to distinguish string variables – seem to have vanished from the listings completely.

In most cases, lines 170 and 260 to 370, it's fairly obvious, but lines 210 and 220 are a bit obscure so here's what they should look like:

```
210date$=num$+" "+inful$+
" "+year$
2200SCLI("KEY10 C/@/"+dat
e$+"|M"+"S ^Z |M")
```

I hope this helps. – **H. L. Smith, Ipswich.**

● We'd like to know where all those quotes went too!

No such error!

WHENEVER I buy a copy of The Micro User *I try to type in the listings – which takes hours – and when I've finished there is always something wrong with the program.*

I always check the line where it states No such variable, *but all is correct when checked from your magazine.*

I've never been able to get one of your programs to run. I've been trying for a year now and I'm fed up with it. – **Mrs. E. Marcham, Romford, Essex.**

● Well, we don't claim to be perfect, but we do have a better record than that. You've run across the age-old problem of the error not actually being in the line reported.

Let's look at a simple example, suppose the program was:

```
10 ddd = 1
20 PRINT ddd
```

and you type:

```
10 fff = 1
20 PRINT ddd
```

When this program is run you'll get the message *No such variable at line 20* because the computer has never heard of a variable called *ddd*. But quite clearly line 20 is right.

So you see the line the error has apparently occurred in is not necessarily the one in which it actually appears.

Easy booting

ALTHOUGH I've created a !Boot program on my disc, whenever I try to do Shift+Break it just doesn't work. What do I have to do? – **Patrick McIntyre, Cwmduad, Dyfed.**

● You have to type *OPT4 3 when the disc is in drive zero. This makes sure that a *EXEC !Boot command is issued when Shift+Break is pressed.

Right tool for free

THANK you for reviewing our Watford Electronics ARM 3 upgrade in the January issue. There was one error.

The review said that the special chip-removing tool costs £15 – actually it is supplied free.

If anyone would prefer not to perform the upgrade themselves we will do it for you, free of charge, if the computer is brought to the shop. – **Nazir Jessa, Watford Electronics, Jessa House, 250 Lower High Street, Watford WD1 2AN.**

Return of the Speeder

THERE are two programs called Speeder and Graphit in the Nuffield Science Year 9 Teacher's Guide used as a teaching aid for year nine physics pupils.

The booklet states that these come from the March 1989 issue of the The Micro User.

When we attempted to type these in our micro crashed at line 510. Is there something wrong with the program or is it us? – **Robert Davies, Bishop Rawstorne C of E High School, Preston.**

● The programs are ours, but they are incorrect in the booklet. In line 510 of Speeder part of the line is:

```
...CHR$&8D;PRINTTAB(...
```

but it should be:

```
...CHR$&8D;:PRINTTAB(...
```

In Graphit, line 230 is completely messed up, and there are errors in several other lines:

```
230 PRINT;INT((8-row%)/scale
+.5);
240 PRINTTAB(3)"_";
300 PRINTTAB(5,12)H$"CAR SPE
EDS DISTRIBUTION";HO$
310 PRINTTAB(5,13)H$"   figu
res in m.p.h.";HO$
500 @%=&10:CLS
540 H$=CHR$131+CHR$157+CHR$1
29:HO$=CHR$32+CHR$131+CHR$15
6
```

Finally,in line 340:

```
25*I%+5*I+J%-30
```

should be:

```
25*I%+5*J%-30.
```

There may be other errors, but these were the ones found on a cursory examination of the most likely trouble spots. They also illustrate the kind of trouble that occurs when a touch typist copies a listing.

ALL programs printed in this magazine are exact reproduction of listings taken from running programs which have been thoroughly tested.

However, on the rare occasions when mistakes occur corrections are published as a matter of urgency. Should you encounter error messages when you type in a program, they will almost certainly be the result of your own typing mistakes.

Unfortunately we cannot answer personal programming queries concerning these mistakes. Of course letters about suggested errors will be investigated without delay, but any replies found necessary will only appear in the letters pages.

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ADVERTISERS INDEX

4Mation	72
4th Dimension	74, 75, OBC
Ace Computing	62
Advanced Comp Systems	106
AJL	124
AL Systems	122
Apricote	60
Automatic Services	130
B & S Computing	30
BBD Dust Covers	59
Beebug	6, 8, 10, 23, 24, 25
Calligraph	59
Cannon Computing	124
Care Electronics	99
City Desk	36
CJE Computing	43
CJ Micros	122
Clares Micro	15, 70
Computer Concepts	12, 13
Computer Depot	124
Computer Focus	106
Computer Tutorial	122
Computereyes	124
Contex	109
Craddock	123
Dabhand	50, 51
Daco Systems	123
Datastore	60
Diamond Comp Systems	14
Diamond PD	106
Electronic Font Foundry	60
Fact Systems	114
GA Computers	122
High Voltage	80
Home Based Business	130
Ifel	46
Integrex	29
Jaffa	60
JR Electronics	122
Kendal Computer Centre	123
Kosmos	109
Lancashire Micros	124
Le Computer	123, 124
Lee Micros	123
Lindis International	46
MD Office Supplies	52
Micro Aid	130
Micro Boss	130
Micro Studio	59
Microfix	106
Minerva	21
Morley	2, 3
Norwich Comp Services	40
Pineapple	22
Pres	26
Silica Shop	33, 53
Software Bargains	18
Superior	IFC
Ted Kirk	114
TMJ Software	130
Universal Comp Support	130
Voltmace	45
Watford	76-89
We Serve	109
Yarm	122

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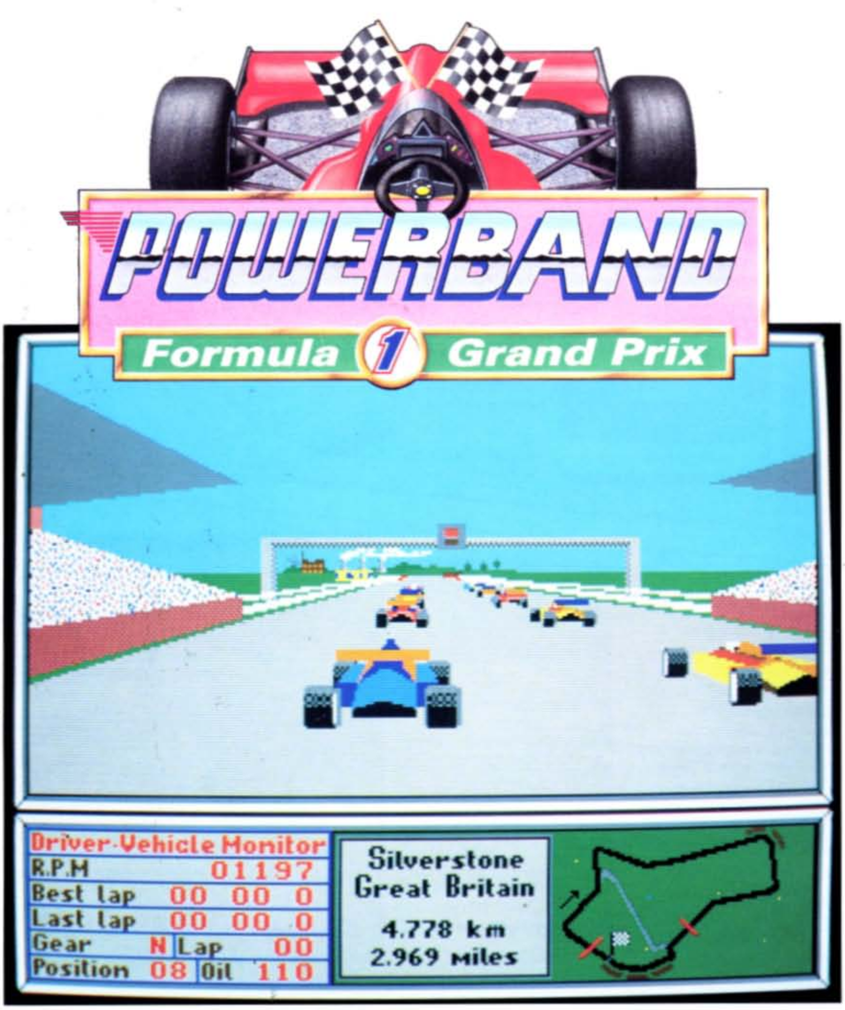
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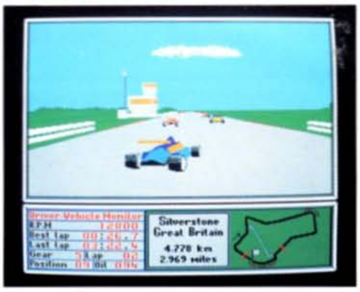
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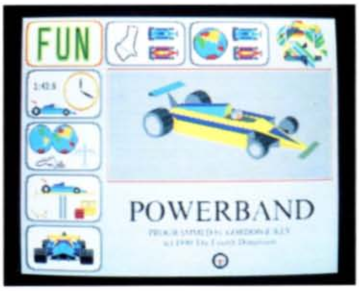
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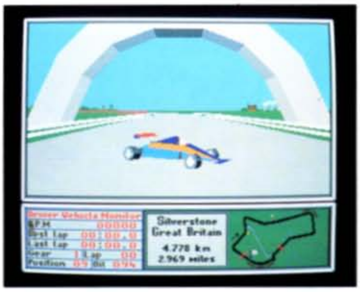
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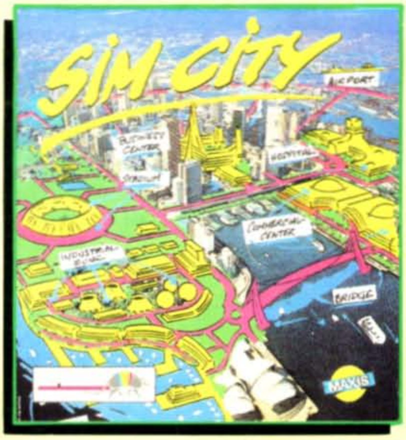

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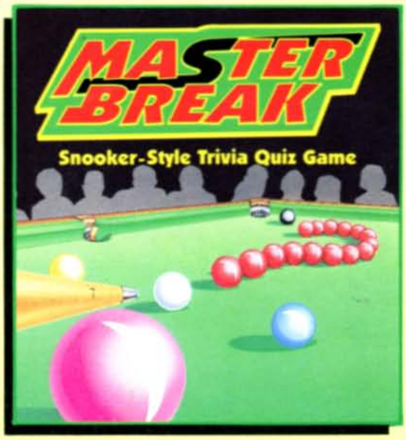

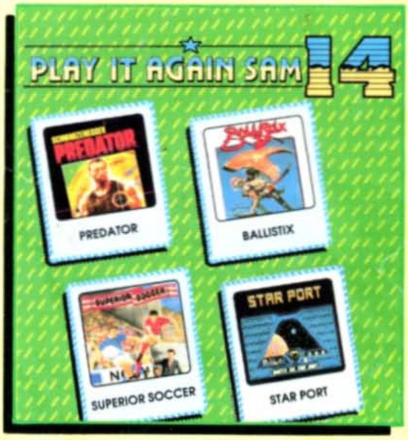

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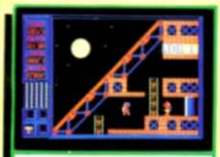
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